THE FIFTIETH YEAR.

Companion to the Almanac;

OR,

YEAR-BOOK

OF

GENERAL INFORMATION

FOR

1877.

PART I.

GENERAL INFORMATION ON SUBJECTS OF ASTRONOMY.
PUBLIC HEALTH, CURRENCY,
SCIENTIFIC INSTRUMENTS, AND ART EXHIBITIONS.

PART II.

ARCHITECTURE AND PUBLIC IMPROVEMENTS,
PAINTING, MUSIC,
LEGISLATION, STATISTICS, AND CHRONICLE OF 1875-76.

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COMPANION TO THE ALMANAC

FOR

1877.

PART I.

GENERAL INFORMATION ON SUBJECTS OF ASTRONOMY, PUBLIC HEALTH, CURRENCY, SCIENTIFIC INSTRUMENTS, ART EXHIBITIONS.

PLANETARY RESEARCH AND DISCOVERY.

THE recent rapidity of planetary discovery has been so great that it is difficult for books of astronomy to keep up with it: and it is only by consulting the current periodicals that any one can be sure that he is *au fait* with its actual state. It appears to us, however, that our readers may be glad to have a collected view of the progress of these discoveries from its first commencement.

Now the generic term planet contains two divisions of bodies: those denominated primary planets, which move round the sun, affected only in a small degree by the attraction of others (which merely produce trifling irregularities or perturbations in their motions); and those called secondary planets or satellites which move round the sun as attendants on one of the primary planets, so that their motions with respect to the latter are in fact in the nature of circulating in an orbit round it as it does round the sun. There was a time when these two classes would have been described as having another fundamental difference, in great comparative superiority of bulk in the first division, but this is no longer the case, since the discoveries of the present century have revealed the existence of a very large number of primary planets, all much smaller in size than a large portion at any rate of the secondary.

The primary planets may be divided into three groups. Four, Mercury, Venus, the Earth, and Mars, are nearer the sun than the rest, and are all not very different from each other in size and density, the diameter of the largest (the Earth) being about $2\frac{1}{2}$ times that of the smallest (Mercury), whilst the ratio of the densities is very small indeed. Then comes the large group of minor planets, consisting of a number (now known to be at least *one hundred and sixty-nine*, and probably many more remain to be found, whilst others may be too small ever to be seen by us at all) of very minute bodies, none exceeding about 200 miles in diameter, and the great majority very much less; these move

round the sun in orbits, which are generally much more eccentric than those of the larger planets, and inclined at much greater angles to the planes of the latter, all of which do not differ extravagantly from each other. Finally, we have the four planets farthest from the sun, Jupiter, Saturn, Uranus, and Neptune, which are very considerably larger than the first group, the diameter of even the smallest (Uranus) being about $4\frac{1}{2}$ times that of the earth, whilst Jupiter's diameter (the largest of all), is 11 times the earth's; the densities of these four (and the fact is remarkable) are much smaller than those of the planets nearer the sun, those of Jupiter and Uranus being about a quarter of the earth's, or nearly the same as the sun's, whilst those of Saturn and Neptune are not much more than half that quarter.

The secondary planets or satellites (so far as they are known) consist of one moving round our earth, four revolving round Jupiter, eight round Saturn, four round Uranus, and one round Neptune. Owing to the great distance of Uranus, and still more of Neptune, it is extremely likely that there may be others circulating round them which have not been discovered. We shall not allude to these bodies further than by giving the following particulars of their discoveries, which have of course been made since the invention of the telescope. The satellites of Jupiter were first seen by Galileo (though a claim, untenable as we believe, has been set up for priority by Simon Marius, or Mayr) in the beginning of the year 1610, and were nearly the first fruits of telescopic research. The satellites of Saturn have in recent years been honoured with names to obviate confusion which had arisen from their numbering in order of discovery not corresponding with that in order of distance from Saturn. In the latter order they stand Mimas, Enceladus, Tethys, Dione, Rhea, Titan, Hyperion, and Japetus. Of these, Titan is by far the largest, and was the earliest discovered, being detected by Huyghens, whilst sojourning in France, on the 25th of March, 1655. Japetus, Rhea, Tethys, and Dione, were discovered by the elder Cassini, who, on the establishment of the Royal Observatory at Paris in 1671, took charge of it at the instance of Colbert after resigning his Italian appointments to do so. There he detected the four satellites in question; the first two in October 1671 and December 1672 respectively, the last two in March, 1684. It was reserved for Sir William Herschel to discover the two satellites, Mimas and Enceladus, nearest to Saturn, which he did by the aid of his powerful instrumental means in the autumn of 1789; Enceladus on August 28th, and Mimas on September 17th. The discovery of Hyperion took place in our own time, and was made simultaneously on the night of September 19, 1848, by Mr. Lassell at Liverpool, and by Professor Bond at Cambridge, in the United States. With regard to the satellites of Uranus, it is well known that their number has given rise to a good deal of discussion, but we do not propose to enter into this with any detail here. The existence of four has been clearly established,

and it is exceedingly probable that others have been occasionally seen and observed, but not sufficiently to obtain the means of calculating their orbits, or to regard them as recognised members of the system. The four which are undoubtedly such (and whose paths are now in fact pretty well determined) have received the names, in order of their distance from Uranus, of Ariel, Umbriel, Titania, and Oberon. Of these, the two latter were discovered by Sir W. Herschel on the 11th of January, 1787, less than six years after his discovery of the planet itself. Some years afterwards he saw at different times what he believed to be four others, but that these were really satellites has not been confirmed by subsequent observations, though much attention has been given to the subject by the few astronomers who have been in possession of instrumental means sufficiently powerful to enable them to search for them; so that, at any rate, Herschel's attempts to determine their orbits were in error. But on the 24th of October, 1851, Mr. Lassell (who, as well as M. Otto Struve of Pulkowa, had been much occupied in this search) discovered, with the aid of the powerful telescope he had transported to Valetta, in the island of Malta, two satellites nearer to Uranus than Herschel's two, and considerably fainter. It was soon after this that it was thought desirable to name the established satellites in order to avoid any risk of confusion; and, as we have said, Herschel's two, discovered in 1787, were denominated Titania and Oberon, whilst Mr. Lassell's recent discoveries received the names of Ariel and Umbriel. During the last two years (1875 and 1876) a valuable series of observations of all four have been made by Professors Newcomb, Hall, and Holden, with the magnificent 26-inch refractor of the Washington Observatory—the most powerful instrument of the kind now in use in the world. These include also observations of the single satellite which is at present known to belong to the outermost planet, Neptune, and which was discovered by Mr. Lassell in Malta in the month of August, 1847, less than a year after the detection of the planet; indeed the first suspicion of the existence of the satellite had occurred to that distinguished astronomer some months before his observations enabled him to announce it with certainty, and to give an approximation to its path.

We have said this much about the satellites or secondary planets* first, because our principal concern is with the planets strictly so called, or the primary planets. Now of these the five which, besides our Earth, are the Sun's nearest principal attendants (leaving out of consideration the supposed intra-mercurial planet, for which the name of Vulcan has been proposed) have been known from the remotest ages of antiquity. Milton, indeed, imagined that they were known to our first parents, Adam and Eve, whom he makes apostrophise them in their beautiful morning hymn as,

* We have not mentioned the supposed satellite of Venus, as we consider its existence very improbable.

"Ye five other wand'ring fires that move
In mystic dance ——."

But at any rate, it was in very early times noticed that amongst all the shining lights which adorned the firmament at night, there were five which moved apparently very capriciously amongst the others, and to which therefore the epithet of planets, or wandering stars, was applied. The identity indeed of Mercury and Venus, when seen in the morning before sunrise, and in the evening after or near sunset, was not at first perceived; and names (Phosphorus and Hesperus) were given to Venus according as she was a morning or evening star. The fact, however, that Phosphorus and Hesperus were never seen together soon led to a suspicion that they were the same object; and the way in which that object passed gradually from the one position to the other, converted this into conviction, the great brilliancy which the planet frequently attained acquiring for it the name of Venus. Mercury is so rarely visible to the naked eye, and then only for a few days, shortly before sunrise or after sunset when near its greatest western or eastern elongation, that it is considered creditable to the ancient observers that they should have recognised its movements at all. The great Copernicus failed in ever perceiving it, but that was in great measure due to his bad observing situation, amongst the fogs of the Vistula. Still, as he was for some time in Italy, the fact is singular. A remarkable instance of its great occasional conspicuousness came under the writer's own notice last January, when a gentleman, resident in Lee (of the medical profession, and a lover of many branches of science) remarked from its motion for a night or two that there was another planet near Venus, which, from not knowing its place, he was unaware was Mercury, then near its greatest elongation. We have, however, the testimony of that practised observer, the Rev. S. J. Johnson, of Upton Helions, Crediton, that it was particularly brilliant in the last week of that month. "I scarcely ever remember," he writes,* "to have seen the planet so well deserving the epithet στίλβων." About the 10th of January of the present year, and again on April 29th, in the evening, it is likely to be also conspicuous. Mars, Jupiter, and Saturn, moving in orbits exterior to the Earth's, are of course visible at different times at all hours of the night; but, owing to their much greater distance from the source of their light, they cannot, like Mercury and Venus, be observed in full daylight, even with a telescope. The powerful reflection of the giant planet Jupiter admits indeed of his being occasionally observed with telescopic aid during partial daylight, or even when the sun is low in the heavens; Mars and Saturn can rarely be seen whilst the sun is above the horizon.

We now come then to the history of the discovery of primary planets, an event of which no instance had occurred until the year 1781, which will be therefore for ever memorable in the annals of astronomy. On the evening of the 13th of March of

* "Nature," March 30, 1876.

that year, Herschel was examining some small stars in the constellation Gemini, when his attention was attracted by one less bright than the others, but appearing to show a sensible disc. "Being struck," he wrote,* "with its uncommon magnitude," he "suspected it to be a comet." Substituting eye-pieces of higher power than that (227 times) which he had on the telescope, he found the apparent diameter of the object to be increased in proportion to the power, which confirmed him in the idea that it was really a comet. Observations made on subsequent nights soon showed that the newly-discovered body was moving, and that in a path declining but very little from the ecliptic. On April 6 he noted: "With a magnifying power of 278 times, the comet appeared perfectly sharp upon the edges, and extremely well defined, without the least appearance of any beard or tail." Before the latter date it had been observed by Dr. Maskelyne, then Astronomer Royal, who at once suspected the planetary character of the stranger. The first observation of it recorded at the Greenwich Observatory was made on April 1 with a five-feet equatoreal sector, in the dome at the western end of the terrace (now disused for astronomical observations), by comparing the planet with a star known as 132 Tauri, meridian observation not being practicable till the autumn, on account of daylight. It being universally recognized that a new planet, and not a comet, as at first supposed, had been added to the solar system by the discovery of Herschel, it became incumbent upon him to propose a name for it. In a letter to Sir Joseph Banks, he expressed his desire to call it, after the name of his royal patron, the Georgian Star, parodying the lines in the first Georgic addressed to Augustus:—

"Georgium Sidus
—— jam nunc assuesce vocari."

He forgot, however, that his argument for its appropriateness —that if in future ages it were asked, "When this last-found planet was discovered?" it would be a very satisfactory answer to say, "In the reign of King George the Third"—could only apply in England. He must have forgotten also that a previous attempt (by Galileo in the case of Jupiter's satellites) to call heavenly bodies after earthly patrons had been a failure. The mythological designation Uranus was early proposed by the German astronomer Bode; and though Laplace, followed by some others, insisted upon calling the planet after the name of its discoverer, Uranus has gradually come into universal use, being first used in the Nautical Almanac in 1851, in place of the term "Georgian."

Such was, in brief, the history of the first discovery of a primary planet ever made. We have next to record the discovery of four in a very different manner at the beginning of the present century. The idea was first started by the illustrious Kepler that there was an unaccountable gap in the order of planetary distances between the orbit of Mars and Jupiter, and that it was probable that there was some unknown planet there. But it was

* "Philosophical Transactions," vol. lxxi, p. 492.

put into a more definite shape by Professor Bode, of Berlin, who noticed that the interval separating the mean distances of each successive planet from the sun was very nearly double the preceding. Thus, taking the earth's distance as 1, that of Venus from the sun is 0·72, and that of Mars 1·52. Now, the difference between 0·72 and 1 is 0·28, and that between 1 and 1·52 is 0·52, nearly double the other, and the same holds good of most of the other distances. But the mean distance of Jupiter is 5·2, so that the interval is much too great, according to this theory (Bode's law, as it has been called). Had there been a planet at the distance about 2·8, the sequence would have been maintained, and as Saturn's proportionate mean distance is 9·54, it is afterwards resumed. Additional plausibility was given to this empirical law by the discovery of Uranus, for that planet's mean distance is 19·18, which exceeds 9·54 by 9·64, somewhat larger indeed than double the preceding interval, 4·34, but still sufficiently like it to carry on the idea, and at any rate to emphasize still more the enormous gap (at that place in the system) between the orbits of Mars and Jupiter. Hence so sure did some of the German astronomers feel of the existence of another planet there, that at a meeting held at Lilienthal in the year 1800, it was resolved to organize a systematic search for it by a society of twenty-four observers, the famous Schroeter being elected president of the association, and the Baron de Zach secretary. The latter about the same time started the *Monatliche Correspondenz*, so useful in diffusing astronomical information, until Schumacher commenced, in 1821, the *Astronomische Nachrichten*, which has since been the principal international organ of communication amongst astronomers. The association had of course little idea of the richness of the mine they were preparing to open; but, singularly enough, they were anticipated at the beginning of their labours by Piazzi, at Palermo, who, on the night of the 1st of January, 1801, noticed a small star in the constellation Taurus, and re-observing it on the following night, found that it had retrograded 4′ in right ascension, besides moving 3·5′ in declination. He followed its motion until the 12th of January, and also wrote to Professor Bode, announcing his discovery. Posts, however, were subject to much delay in those days, and it took much longer to send news from Sicily to Germany than it does now (thanks to the Atlantic Cable) from America to Europe, so that no one else was able to observe it till it was too near the sun to be seen at that opposition. Bode, however, immediately suspected it to be the sought-for planet. Olbers and Gauss calculated its orbit as well as could be done from the small arc through which it had been observed, and by that means De Zach succeeded, after much difficulty from its small size, in finding it again on the last day of the same year (December 31, 1801). When its orbit was well determined, it was found that its proportional mean distance from the sun was 2·77, fairly agreeing with Bode's so-called law. Meanwhile, on the 28th of March of the following year, Dr. Olbers, at Bremen, discovered another planet, which received the name of Pallas, as

the former had that of Ceres. Gauss was not long in determining its orbit from the observations, and the suggestion of Olbers that the two small bodies might be fragments of a larger one which had exploded in some way led to a continuation of the search. The next body found was discovered by Harding, at Lilienthal (where the association of observers was formed), on the 2nd of September, 1804, and denominated Juno. By laboriously searching in the parts of the sky where he conjectured other planetary fragments might be found, near the nodes of the orbits of Ceres and Pallas, Olbers at length detected, on the 29th of March, 1807, in the constellation Virgo, a small planet, brighter than the other three (sometimes it is even visible to the naked eye). To this the name of Vesta was given, and with it planetary discovery ceased for nearly forty years. The search was continued indeed until 1816, but without result, and though, in the month of May, 1835, Piazzi's successor at Palermo, Cacciatore, observed an object, the motion of which led him to believe that it was a planet, the observations he made were quite inadequate to secure it.

In the year 1845 planetary discovery re-commenced, and from that time to the present has been continuous. The first to enter on the harvest was Herr Karl Hencke, who held an official post in the Post Office at Driesen, in the Prussian province of Brandenburg, but devoted his leisure to astronomical observing, and had made himself familiar with large parts of the heavens near the ecliptic, which he had mapped. On the 8th of December, 1845, whilst observing Vesta, then of considerable brightness, in the constellation Taurus, and examining the stars in its neighbourhood, he noticed one of the ninth magnitude, which he felt sure was not there before; and he was so well acquainted with the region that he considered it unlikely that it was a variable star, but rather thought it probable that it was a new planet, particularly as it was not marked in the star-charts of the Berlin Academy. He therefore immediately communicated with Professor Encke, who observed the object at the Berlin Observatory on the 14th of December, which at once showed its motion and proved it to be a planet. It was soon extensively observed, and shown to be another member of the family of small planets, with a mean distance from the sun of 2·58 in terms of the earth's distance; and the name Astræa was selected for it by Encke at the request of the discoverer. Herr Hencke was fortunate in catching it at a time when the brightness of the small object was at about the greatest it ever attains. Encouraged by his success, he continued scrutinizing parts of the sky near the ecliptic, and comparing them with the Berlin charts; the result of which search was that, on the 1st of July, 1847, he discovered another planet, to which the name Hebe was given. But meanwhile a planetary discovery of another class had been made, which will ever be considered, by the way in which it was attained, one of the grandest of astronomical achievements. Of course, we allude to that of Neptune, the outermost (so far as at present known) body

of the solar system, which occupies nearly 165 years in revolving round the sun, at a mean distance of nearly 2,800 millions of miles, or more than thirty times our own. This distance is, however, considerably less than that at which the next planet ought to be placed, according to the empirical law of Bode, so that though that law was taken as the basis of the first calculations made for the purpose of detecting a planet which, unseen, made its existence known by its powerful attraction, much modification in them had to be subsequently made. We have not space here to enter into the long details of the history of the discovery, which are indeed well known to all interested in astronomy, and are given more or less in every modern book on that science. The first idea of the existence of such a planet was started by M. Bouvard, who, on forming his theory and tables of Uranus, found it impossible to reconcile the earlier and later observations, and was led to suspect the existence of some other planet beyond it, producing irregularities in its motion. The possibility of the discovery of such a planet was much discussed, and the problem of predicting its place, so as to enable observers to see it, was taken in hand by Mr. (now Professor) Adams as early as 1843. His final investigation was communicated to the Astronomer Royal in October, 1845. Meanwhile Le Verrier had turned his attention to the subject. His first paper upon it appeared in the *Comptes Rendus* of the French Academy for November 10, 1845; a second and third (still more complete) on the 1st of June and on the 31st of August, 1846. On the 23rd of September Dr. Galle, then of the Berlin Observatory, received a letter from M. Le Verrier, requesting him to look for the planet at a particular place in the sky, and saying that he thought it would be large enough to be recognized as a planet by its disc. Dr. Galle at once complied, and the same night noticed a star of the eighth magnitude near the place in question which was not marked in the Berlin star-chart (there made by Bremiker). Observations on the following two nights showed by the motion that this was indeed the planet sought. As for a sensible disc (to use Professor Encke's expression with regard to it) it was only to be recognized in appearance as a planet by one who was aware of its nature as such. Meanwhile Mr. Adams's calculations had not remained a dead letter; but Professor Challis, working from them, had commenced a search for the planet over the arc in which those calculations had shown it to be likely that it was situated. It was unfortunate that at the time the resources of the Cambridge Observatory were so taken up that he was not able to spare time to discuss the results of his sweep each day as they were made; for, not being in possession of Bremiker's chart, there was no alternative but to map the arc in question, and to repeat the observations for comparison. Professor Challis's search commenced on the 29th of July, 1846, and terminated, on his hearing of Dr. Galle's discovery, in the following September. On comparing afterwards his own observations *inter se*, he found that he had in fact observed the planet twice—on the 4th of

August and on the 12th of the same month ; moreover, on the 29th of September (after Neptune's discovery by Galle, but before the news of it had reached Cambridge) he noted an object which, from a suspicion that it had a sensible disc, he intended to look for again, when in the meantime he found he had been anticipated at Berlin.

We now come to the planetary discoveries of Mr. Hind, which added so large a number to the previously known list of small planets revolving at various distances between the orbits of Mars and Jupiter. These were all made at the observatory erected by the late Mr. Bishop, in the grounds of his private residence in Regent's Park, London. Mr. Hind commenced a vigorous search with the aid of the star-charts of the Berlin Academy (extending them in certain places where they fell short of the ecliptic limits in declination), in the month of November, 1846. After nine months of scrutiny, a planet was discovered in the constellation Sagittarius, on the 13th of August, 1847 (about six weeks after Hencke's discovery of Hebe), to which the name of Iris was attached. On the 18th of the following October, Flora was found in the same manner. Next spring, Mr. Graham entered the field, at Mr. Cooper's private observatory, at Markree Castle, county Sligo, Ireland, and discovered a planet named Metis, on the 25th of April, 1848. About a year afterwards, Dr. Annibal de Gasparis, assistant at the Royal Observatory at Naples, made his first discovery, and as his, like Mr. Hind's, are many in number, it may be as well to give them in tabular statement, thus :—

Name.	Date of Discovery.	Name.	Date of Discovery.
Hygeia	1849, April 12.	Massilia.. ..	1852, September 19.
Parthenope ..	1850, May 11.	Themis	1853, April 6.
Egeria	1850, November 2.	Ausonia ..	1861, February 10.
Eunomia ..	1851, July 29.	Beatrix.. ..	1865, April 26.
Psyche	1852, March 17.		

After this last date, this zealous observer was "rude donatus," and many others had entered into the same field, so much more fertile then had been at first supposed. But we must now give a similar table of Mr. Hind's discoveries in this line :—

Name.	Date of Discovery.	Name.	Date of Discovery.
Iris	1847, August 13.	Fortuna ..	1852, August 22.
Flora	1847, October 18.	Calliope ..	1852, November 16.
Victoria.. ..	1850, September 13.	Thalia	1852, December 15.
Irene	1851, May 19.	Euterpe ..	1853, November 8.
Melpomene ..	1852, June 24.	Urania	1854, July 22.

A few months after the discovery of the last of this list, the first transatlantic planet was discovered by Mr. Ferguson, at Washington, on the 1st of September, 1854. It was named Euphrosyne ; and the same gentleman afterwards discovered

Virginia, on October 4, 1857, and Echo, on September 14, 1860. Mr. Marth was the first discoverer of Amphitrite, on March 1, 1854, at Mr. Bishop's observatory, in Regent's Park. The late M. Chacornac discovered the first (Phocea) of the following six, at Marseilles, and the remaining five whilst he was attached to the Imperial Observatory, at Paris :—

Name.	Date of Discovery.	Name.	Date of Discovery.
Phocea	1853, April 6.	Leda	1856, January 12.
Polyhymnia ..	1854, October 28.	Letitia	1856, February 8.
Circe	1855, April 6.	Elpis or Olympia	1860, September 12.

We may now mention five small planets, each of which has been the sole contribution of its discoverer to our knowledge of the group. They are, Nemausa, discovered by M. Laurent, at the Observatory of Nismes, on the 22nd of January, 1858 ; Pandora, by Mr. George Searle, at the Observatory of Albany, U.S., on the 10th of September, in the same year ; Erato, by Professor Förster, at Berlin, on the 14th September, 1860 ; Hesperia, by Professor Schiaparelli, at Milan, on April 29, 1861 ; Freia, by the late illustrious director of the Copenhagen Observatory, Professor D'Arrest, on the 14th November, 1862 ; and Semele, by Dr. Tietjen, at Berlin, on January 4, 1866.

Coming next to some of the astronomers who have made the largest additions to the list, we have to name first, Dr. R. Luther, of Bilk, near Düsseldorf, who discovered :—

Name.	Date of Discovery.	Name.	Date of Discovery.
Thetis	1852, April 17.	Niobe	1861, August 13.
Proserpine ..	1853, May 5.	Diana	1863, March 15.
Bellona	1854, March 1.	Alcmene ..	1864, November 27.
Leucothea ..	1855, April 19.	Clio	1865, August 25.
Fides	1855, October 5.	Antiope ..	1866, October 1.
Aglaia	1857, September 15.	Arethusa ..	1867, November 23.
Calypso	1858, April 4.	Hecuba	1869, April 2.
Mnemosyne ..	1859, September 22.	Amalthæa ..	1871, March 12.
Concordia ..	1860, March 24.	Peitho	1872, March 15.
Leto	1861, April 29.	Sophrosyne ..	1873, September 27.

Not much less numerous have been the contributions of the late M. Hermann Goldschmidt, and they must be considered amongst the most remarkable from the slender means at his disposal, so that the earlier ones were made with telescopes of very small power, pointed through a window of a garret, in a street in Paris. His list is as follows :—

Name.	Date of Discovery.	Name.	Date of Discovery.
Lutetia	1852, November 15.	Melete	1857, September 9.
Pomona	1854, October 26.	Doris	1857, September 19.
Atalanta ..	1855, October 5.	Pales	1857, September 19.
Harmonia ..	1856, March 31.	Europa	1858, February 6.
Daphne	1856, May 22.	Alexandra ..	1858, September 10.
Nysa	1857, May 27.	Danaë	1860, September 9.
Eugenia	1857, June 28.		

The eighth of these (Melete) was, when it was first discovered, supposed to be Daphne, which had been lost for a time. When it was found out to be a new planet (by the computer of its orbit, Mr. Schubert) it was for a considerable time known as Pseudo-Daphne, in allusion to that fact, until the name suggested by the Greek proverb (*μελέτη τὸ πᾶν,*) was chosen for it. In lists of the small planets it usually appears out of place in the order of discovery, it being difficult to disturb the numbers with which later ones had become associated.

Mr. Pogson commenced his small planet discoveries with that of Isis, at Oxford, on the 23rd of May, 1856; and afterwards detected at the same place, Ariadne and Hestia, on the 15th of April, and the 16th of August, 1857. After his removal to the East Indies, as Director of the Madras Observatory, he discovered there four more, Asia, Sappho, Sylvia, and Camilla, on the dates, April 17, 1861, May 2, 1864, May 16, 1866, and November 17, 1868, respectively.

The next who put in the scythe was Herr Tempel, by the discovery at Marseilles, of Angelina, on March 4, 1861, and Cybele (at one time called Maximiliana), on March 9, only five days afterwards. These were followed by Galatea, on August 29, 1862, and Terpsichore, on September 30, 1864. His next and last discovery of this kind was that of Clotho, on February 17, 1868.

Mr. H. P. Tuttle, of Harvard College, Cambridge, U.S., discovered two; Maia, on the 9th of April, 1861, and Clytie, on the 7th of April, 1862.

We now come to the discoveries of the astronomer who has contributed more members to the long list of minor planets than any other,—Dr. C. H. F. Peters, of the Hamilton College Observatory, Clinton, U.S. The first of these (Feronia) was detected in the year 1861, accidentally; being very near Maia, then a recent discovery and of which Dr. Peters was making a series of observations, it afterwards appeared from the calculations of Mr. T. H. Safford, that a part of them, commencing with May 29, really related to another planet, hitherto unknown. Beginning then with this, the following are the additions to the small planets made by Dr. Peters, *twenty-six* in number:—

Name.	Date of Discovery.	Name.	Date of Discovery.
Feronia	1861, May 29.	Gerda	1872, July 31.
Eurydice ..	1862, September 22.	Brunhilda ..	1872, July 31.
Frigga	1862, November 15.	Alceste	1872, August 23.
Io	1865, September 19.	Antigone ..	1873, February 5.
Thisbe	1866, June 15.	Electra	1873, February 18.
Undina	1867, July 7.	Vala	1873, May 24.
Ianthe	1868, April 18.	Hertha	1874, February 18.
Miriam	1868, August 22.	Vibilia	1875, June 4.
Felicitas	1869, October 9.	Adeona	1875, June 5.
Ate	1870, August 14.	Una	1876, February 21.
Iphigenia ..	1870, September 19.	Loreley ..	1876, August 10.
Cassandra ..	1871, July 23.	Rhodope ..	1876, August 17.
Sirona	1871, September 8.	Urda	1876, August, 28.

Little more than ten years ago, an observatory was established at Marseilles in connection with the Imperial Observatory at Paris, and M. Stéphan was appointed its director. Under him it has been fruitful in planetary and cometary discoveries, of which we are now only concerned with the former. M. Stéphan discovered one called Julia, on August 6, 1866 ; and one of his assistants, M. Coggia (whose name is so well known as attached to the fine comet seen in the summer of 1874), detected Ægle, on the 17th of February, 1868. The other assistant, M. Borelly, discovered Ægina, on November 4, 1866 ; Dike, on May 29, 1868 ; Lydia, on April 19, 1870 ; Lomia, on September 12, 1871 ; Lachesis, on April 10, 1872 ; Lucina, on June 8, 1875, and Dejanira on December 1, 1875.

Another American astronomer now appears upon the scene, Professor Watson, of the Observatory of Ann Arbor, Michigan. His discoveries have been very numerous, and are comprised in the following list :—

Name.	Date of Discovery.	Name.	Date of Discovery.
Eurynome	1863, September 14.	Thyra	1871, August 6.
Minerva.. ..	1867, August 24.	Althea	1872, April 3.
Aurora	1867, September 6.	Hermione ..	1872, May 12.
Hecate	1868, July 11.	Nemesis ..	1872, November 25.
Helena	1868, August 16.	Æthra	1873, June 13.
Hera	1868, September 7.	Cyrene	1873, August 16.
Clymene.. ..	1868, September 13.	Juewa ..	1874, October 10.
Artemis	1868, September 16.	No. 150 ..	1875, October 19.
Dione	1868, October 10.	No. 161 ..	1876, April 18.
		No. 168 ..	1876, September 27.

The last three of these are as yet unnamed, and are distinguished only by their numbers in a general list. Juewa was discovered at Pekin, where Professor Watson had gone to observe the transit of Venus, in the following December.

The next batch we shall mention consists of eleven found by the brothers Henry, at the Paris Observatory. M. Prosper Henry discovered Liberatrix, on September 12, 1872 ; Johanna, on November 5 of the same year ; Gallia, on August 7, and Bertha on November 4, 1875 ; and Nos. 162 and 169 (unnamed), on April 21 and September 28, 1876. M. Paul Henry's discoveries are Velleda, on the 5th of November, 1872 ; Lumen, on the 13th of January, 1875 ; Atala, on the 2nd of November, of the same year ; Emilia, on the 26th of January ; and Eva, on the 12th of July, 1876.

Two more planets were each the single contribution of one observer, Protogeneia, found by Dr. Schulhof, of the Imperial Observatory, at Vienna, on July 10, 1875, and Koronis, by Herr Knorre, at Berlin, on January 4, 1876.

A small observatory, established a few years since by the Austrian Government, at Pola, near Trieste, has furnished a considerable quota to the list. Herr Palisa, its director, discovered a planet to which he gave the name of Austria, on the 18th of March, 1874 ; and followed it on by detecting Melibea, on the 21st of April, and Siwa, on the 13th of October, of the same year. In the following year (1875) he also found Polana, on January

28 ; Adria, on February 23 ; Abundantia, on November 1 ; an unnamed one, No. 155, on November 8, and Xanthippe, on November 22.

Finally, we have to record the discoveries (three in number) of M. Perrotin, at Toulouse. They comprise Tolosa, found on May 19, 1874 ; No. 149, on September 21, 1875, and No. 163, on April 26, 1876.

When at the beginning of the century, the first of the small planets was found, little was it imagined how large a number there really were ; now of course the probability is that it is very great indeed. As may be supposed, the brightest were as a general rule picked up first, and the most recent discoveries are exceedingly faint.

The inclinations and eccentricities of the orbits are in general much greater than those of the large planets ; the distances from the sun are very various, some being not much more than that of Mars, and others not much less than that of Jupiter Attempts have been made to test the old idea of Olbers that they might be fragments of a large planet, which had been separated by some explosion or other catastrophe ; but as it did not appear that they could actually be traced back to any common point, that idea has been abandoned. The reflection that is principally suggested to us by the consideration of these discoveries and those of comets and meteoric streams, is what a wonderful collection of moving bodies is contained within our solar system. It has become a trite remark to call to mind with what unerring precision the motions of all these bodies can be calculated (when once the elements of their orbits have been accurately determined) in accordance with the Newtonian law of universal gravitation. But it may be not out place to remark that not only is this law no *à priori* truth, capable of demonstration like the theorems of Euclid, but one which the genius of Newton unravelled from the laws empirically deduced by Kepler from astronomical observations (chiefly those of Tycho Brahe); not only, we say, is this the case, but the law of gravitation, according to which every body in the universe attracts every other directly in proportion to the mass of the attracting body, and inversely as the square of the distance between the two, is capable of explaining the planetary and other motions of celestial bodies only by uniting it with the so-called laws of motion. These laws also are no part of the necessary constitution of matter, nor could they ever have been known by mere mathematical reasoning ; our knowledge of them is due to observation, and the philosophical experiments by which Galileo established them, contributed immensely more to the progress of science than did his discoveries with the telescope. With much more force than Anaxagoras of old, can we feel that both the great and small bodies around us are moving under the control of mind or intelligence—the intelligence, indeed, of the Divine Mind, which has impressed upon matter those constant laws by which science teaches us that its motions are governed and directed.

ADDENDUM.—In view of the continued rapid progress of discovery of small planets, we have thought it desirable to append a table of those found during the last two years in the order of discovery. It is as follows :—

No.	Name.	Name of Discoverer.	Date of Discovery.
141	Lumen	Paul Henry	1875, January 13.
142	Polana	Palisa	,, January 28.
143	Adria	Palisa	,, February 23.
144	Vibilia	Peters	,, June 3.
145	Adeona	Peters	,, June 3.
146	Lucina	Borelly	,, June 8.
147	Protogeneia	Schulhof	,, July 10.
148	Gallia	Prosper Henry	,, August 7.
149	..	Perrotin	,, September 21.
150	..	Watson	,, October 18.
151	Abundantia	Palisa	,, November 1.
152	Atala	Paul Henry	,, November 2.
153	Hilda	Palisa	,, November 2.
154	Bertha	Prosper Henry	,, November 4.
155	..	Palisa	,, November 8.
156	Xanthippe	Palisa	,, November 22.
157	Dejanira	Borelly	,, December 1.
158	Koronis	Knorre	1876, January 4.
159	Emilia	Paul Henry	,, January 26.
160	Una	Peters	,, February 20.
161	..	Watson	,, April 16.
162	..	Prosper Henry	,, April 21.
163	..	Perrotin	,, April 26.
164	Eva	Paul Henry	,, July 12.
165	Loreley	Peters	,, August 10.
166	Rhodope	Peters	,, August 17.
167	Urda	Peters	,, August 28.
168	..	Watson	,, September 27.
169	..	Prosper Henry	,, September 28.

Although the excessive smallness of the mass of the members of the extensive group of minor planets prevents their producing any effect upon the motions of the larger bodies of the system, the reverse effect of the latter upon the motions of the small planets is, in certain cases when they come within a small distance of Mars or Jupiter, very sensible, and advantage has been taken of it to determine the mass of Jupiter, the largest and most powerful of all the planets. Professor Krüger of Helsingfors obtained, about three years ago, a careful determination of this kind from the planet Themis, which agrees well with those obtained by other methods, viz., by the motions of Jupiter's own satellites, and by those of Faye's comet. The labours of Dr. Galle have shown that some of the brightest of the small planets may be employed to confirm our knowledge of the sun's distance, of which important element he has recently obtained by observations of Flora, a value nearly the same as that which results from other methods. If, therefore, a selection has to be finally made amongst the small planets, those will be chosen for continued observation and accurate calculation of orbit which approach nearest to the large planets Mars and Jupiter, on either side of the group, as well as those which are the brightest, and probably of the greatest magnitude. W. T. LYNN.

PUBLIC HEALTH AND MORTALITY.

THE tempting picture of a city comparatively free from sickness, because totally free from defects as far as its natural position and its sanitary arrangements are concerned, has been placed before the public during the past year, and an effort will, it is said, shortly be made to prove by experiment the possibility of attaining the proposed end. Anything more absolutely desirable than Dr. Richardson's Hygeiopolis it would be difficult to imagine, but to the practical mind it must be obvious that such schemes can at the most be but partially adopted, and that their chief benefit must lie in the evidence they afford by sheer force of contrast as to the advantages to be derived from the observance of what may be broadly termed the laws of health, and as to the possibility of escaping a large number of the ills to which man is popularly, but, as facts prove, very erroneously, believed to be the heir. In expressing the opinion that such schemes are unlikely to be speedily successful, we are far from wishing to imply that they are absolutely Utopian; rather we believe them to be far more capable of realization than the leaders of local government are inclined to imagine; but it is precisely because of the apathy of the majority of public bodies, and the almost equal negligence of individual householders that we regard any genuine reform as being inevitably a work of time, and even of several generations. That we have in sanitary matters advanced to a remarkable degree of late years all students of our national condition will gladly admit, and in the course of time education in this respect may be so far extended that cities where the public health is esteemed the first consideration may become more and more common, but for the present the value of such plans as that advocated by Dr. Richardson, must, as we have suggested, lie in the attention which they draw to a great and important subject rather than in any immediate and universal attempt to enforce the principles advocated by their promoters. And of precisely the same character as this effort to present in the concrete the ideal of a healthful town are the annual reports which are issued under the editorship of Dr. Farr from the office of the Registrar-General of births, deaths, and marriages, and the reports which have for some years past been issued by Mr. Simon from the Medical Department of the Local Government Board. In Dr. Farr's returns, which perhaps receive from the newspapers more attention than is given to the publications of any other Government department, we have week after week, month after month, and year after year, masses of facts and figures, showing not only the numerical progress of the nation, but its growth or decadence in particular districts, and the causes which affect its well-being in one direction or the other in those districts; we see not only that babes are born, that men and women marry, and that young men and maidens, old men and children alike die, but we see

actually before us the reasons why these processes of nature are worked out more speedily in one place, or in one section of society, than in another, and, if men were wise, if they were willing to read between the lines, and to accept the lessons that were offered, they might to a great extent change the face of human life. From such records, dealing with humanity, not only in the aggregate, but at the several age-periods of life, under the different aspects of town and country existence, and even under the still more various conditions of the daily occupation which has so much to do, not only with health and happiness, but absolutely with the duration of life, we have a constant reflection of the picture which the nation itself is throwing on the great mirror of time, and as we look beyond its lights and shadows, we see at work the causes which, if rightly regarded, would enable us to disperse many a cloud, and to render many an existence brighter, purer, and in the highest sense better. There is, in fact, in the records thus placed before us, as in the stones under our feet, a sermon if we will but heed it, and those who turn aside from the blue book as a mere collection of figures, uninteresting as the share list in the daily paper to the reader who has no stocks, make a mistake which cannot too often be pointed out. If, indeed, Dr. Farr's vast tabular returns were of as little value as nine-tenths of the public imagine, judging by the slight regard that is paid to their teachings, the time and money expended on their production would be a gross waste. That the contrary is really the case is, however, easy of proof, and it would be well if the stern lessons which are here set forth of the results of neglecting the most elementary laws of life were brought home to those whose duty it is not only to guide, but to teach the people. That there is an urgent need for such teaching public men who are not only qualified, but honest enough, to tell the truth, do not hesitate to affirm, and Mr. Simon, whose recent retirement from the post of Medical Officer to the Privy Council and Local Government Board is deeply regretted by all true sanitary reformers, has more than once spoken out plainly on the subject. Writing in 1854, he said : "Except against wilful violence life is practically very little cared for by the law. Fragments of legislation there are indeed in all directions, enough to establish precedents, enough to testify to some half-conscious possession of a principle, but for usefulness little beyond this. The statutes tell that now and then there has reached to high places the wail of physical suffering. They tell that our law-makers to the tether of a very scanty knowledge, have, not unwillingly, moved to the redress of some clamorous wrong. But, tested by any scientific standard of what should be the completeness of sanitary legislation, or tested by any personal endeavour to procure the legal correction of gross and glaring evils, their insufficiencies, I do not hesitate to say, constitute a national scandal, and perhaps, in respect of their consequences, something not far removed from a national sin."

That this grave indictment was justified by facts when it was

written was amply proved, and has been proved over and over again in the twenty and more years that have since passed away, and although we have advanced, and are advancing, the need of the utilisation of the knowledge we possess is as urgent as ever, and the sources from which it can be derived are therefore well worthy of attention. Looked at, then, as something more than an aggregation of figures, we may find in Dr. Farr's reports, as in Mr. Simon's, matter which suggests not only thought but action ; we may see in them the amplification of the great text "Sanitas, omnia sanitas," on which Mr. Disraeli once began to preach, and which, it may be hoped, will furnish Lord Beaconsfield with a basis for much useful practice ; and even to the ordinary Englishman they present food for reflection and a ready means of judging how far he is liable to suffer from effects of which the causes are here laid bare to view, and how far those causes can be controlled by watchful care, or removed altogether by compulsory measures.

But while each annual report is valuable in itself, it is from the comparison of the figures of a series of years that the most trustworthy and useful deductions can be made, and to his twenty-fifth annual report Dr. Farr has added an appendix, giving a most exhaustive series of tables showing the mortality in the registration districts of England during the years 1861 to 1870 as compared with a similar series of tables for the previous ten years. To this appendix we propose to direct the reader's attention. And, first, as a justification of the labour involved in the preparation of the work, we are supplied with certain facts to show that the knowledge gained from tables such as these is of vital importance. To take small-pox as an instance, after it had been learnt that a milder type of the disease could be induced artificially, fatal to few of the inoculated, the practice of inoculation was introduced in London, and was publicly performed in the years 1746 to 1763 on 3,434 persons at the Small-pox Hospital, only 60 of whom, it is said, died of the disease. But it was found that the deaths from small-pox in London, compared with the deaths from all other causes, and also the absolute mortality, increased considerably when inoculation became common, and subsequently it was made illegal. Then vaccination was introduced, and its benefits at once became apparent, for cow-pox, unlike small-pox was completely innocuous. From 1771 to 1780 small-pox caused 100 out of every 1,000 deaths in London, but from 1831 to 1835 it only caused 27 in every 1,000, while in 1861 to 1870 the number was reduced to 11. But, in order to prove that while the figures of the statistician thus tell a pleasant tale only when he is justified in prophesying smooth things, we have the other side of the shield held up to view, and it is shown that as the mortality from small-pox decreased, the deaths from scarlet fever, clearly traceable to the increasing density of the population, rose. So again, the evidence is complete as to the indirect causes which contribute to a large increase in the rate of mortality, among which must be reckoned the spread of civilization. As

people multiplied, they assembled in cities, and London itself has been perhaps the most notorious example of the evils inseparable from density of population without proper safeguards, as, for instance, at the time of the plague and the cholera epidemics. So, too, has it been in the manufacturing towns and mining districts in Lancashire, Yorkshire, Durham, and South Wales, where the people have congregated in search of work, but where insufficient means have been adopted to ensure attention to health. And yet even in such cases the records mark considerable progress, for while the mortality of the city of London was at the rate of 80 per 1,000 in the latter half of the seventeenth century, it fell to 50 in the eighteenth, and has since been reduced to 24, while even during the later cholera epidemics there was a noticeable decline in the death-rate, as compared with previous visitations. This is at any rate a proof that the mortality can be reduced, even when death is literally stalking through the streets, and when we find that, including the London district of Hampstead, there are fifty-four large tracts of England and Wales which actually experience a mortality at the rate of only 17 per 1,000—less by *five* than the average mortality per 1,000 of the whole country, less by *ten* than in nine districts, and less by *twenty-two* than the average mortality of ten years in Liverpool; and when we are told that in those fifty-four districts the sanitary shortcomings are palpable, we have abundant evidence that a death-rate of 17 per 1,000 need not be exceeded. The healthy districts have, it is admitted, a salubrious soil, and supply the inhabitants with water generally free from organic impurities; but the people are by no means wealthy, the great mass of them are labourers and work-people on low wages, whose families get few luxuries and very rarely taste animal food, while their cottages are sometimes crowded and impurities abound, and therefore Dr. Farr is, it must be admitted, justified in assuming that "any excess of mortality in English districts over 17 annual deaths in every 1,000 living is an excess not due to the mortality incident to human nature, but to foreign causes, to be repelled and, by hygienic expedients, conquered." In other words, we have in this single fact the amplest justification for the compilation of these returns in the test which they furnish as to the relative healthiness of various localities, and the means which they afford, absolutely ready to hand, of enabling the inhabitants of any district to form an opinion as to its sanitary condition. The importance of the investigations on this point becomes still more clear when it is stated that the mean annual deaths at the rate of 22·4 in the ten years 1861 to 1870 were 479,450 in England, but that if the rate of mortality had been 17 (which experience proves to be by no means below what it might be everywhere), the annual deaths would not have exceeded 363,617, so that the surplus, or 115,833, may be said to have been directly attributable to the operation of causes existing, but less destructive, in the healthier districts. From this the conclusion is irresistible—that many at least of these 115,833 deaths might have been prevented or postponed if proper

care had been exercised in the application of those hygienic measures which are now so well understood that their neglect on the part of the responsible local authorities becomes little short of criminal. In other words, as Mr. Simon pointed out in one of his most valuable reports—the supplement to his annual report for 1873—"it would seem, *primâ facie*, that influences hostile to life must be operating in parts of England far more vehemently than in other parts," and he proves his case by a reference to the Registrar-General's returns. While, for instance, in a considerable proportion (about a seventh of the number) of the districts into which England is divided for registration purposes, the death-rate of infants in the first year of life averages from 8 to 12 per cent., there is a still larger proportion of districts in which it ranges even from 19 to 30; and under the influence of these Herodian districts the infant death-rate of England as a whole stands at the high rate of 18. Similarly taking the death-rate of the population at all ages, we find that the present general English annual death-rate of about 22½ per 1,000 covers on the one hand local death-rates ranging from 13 to 17, and, on the other hand, local death-rates which range even to far above 30. The question, then, which concerns the nation at large is how far the causes which operate in such cases can be dealt with by public hygiene, and how far they can be, and therefore ought to be, touched by the law, either nationally or locally.

In order to show in the clearest way how great is the divergence between the prospects of death in different localities, with no other apparent reason than what may be termed preventible causes, Dr. Farr contrasts the Liverpool district, which has attained an unenviable notoriety, with the healthy districts. In the 51 favoured districts, it is found that the annual number of deaths of boys under five years of age was, in the ten years from 1861 to 1870, 4·246 per cent., and of girls, 3·501; whereas in the district of Liverpool, the mortality of boys was 14·475, of girls 13·429; and in this emphatically black district it appears that of 10,000 children born alive, only 5,396 live five years, a number that in the healthy districts would be the remanet from 6,544 annual births. In Liverpool, we are told that "the death of children is so frequent and dreadful, that a special system of insurance has been devised to provide them with coffins and burial ceremonies. The mother when she looks at her baby is asked to think of its death, and to provide by insurance, not for its clothes, but for its shroud and other cerements. There are cases where a wretched parent has insured the life of her baby, and realized money by the transaction; but there is no statistical evidence to show that this is a systematic trade, rather the reverse; all that is certain is, that the children are bred in such unfavourable and unnatural conditions, that they perish in excessive numbers. The extent to which the several causes contribute to their destruction requires further investigation; but enough is known to justify the belief that such causes may be, to a considerable extent, removed." This recital of horrors sounds almost like the

sensational description to which special correspondents have accustomed the readers of certain daily newspapers during the Turco-Servian war, and yet it is nothing but the prosaic deduction of a statistician from facts and figures; and as a proof that the infantile mortality of Liverpool is only a part of the evil, we find that the sacrifice of the lives of men at the most productive ages, from 35 to 55, is almost equally great, the deaths out of the same numbers living being as three, in the Liverpool district, to one, in the natural state of the working population of extensive districts of the kingdom. This contrast is brought out with still greater clearness if the range of comparison is enlarged. Thus, the average annual rate of mortality for every hundred persons, of all ages, from 1861 to 1870, was as under :—

	51 Healthy districts.	England and Wales.	London.	Manchester district.	Liverpool district.
Males	1·756	2·361	2·655	3·538	4·097
Females	1·623	2·128	2·234	3·046	3·636

Thus it will be seen that the combined death-rate of the whole of England and Wales, taking the healthy and unhealthy districts, gives a mortality of about 2⅓ per 100, but in Liverpool it is nearly double, Manchester standing next in unhealthiness, while the London rate is slightly above the average of the whole country, and one-third greater than the average of the 51 healthy districts. These figures, the trustworthiness of which is supported, as we said at the outset, by the fact that they are based, not upon one year, but upon ten years' calculations, also prove that the mortality of males exceeds that of females at all ages and in all districts, and that the mortality of the large towns is the highest.

This last-named fact supplies one clue, at least, to the causes of a high rate of mortality, and proves, beyond a doubt, that it increases in proportion to the density of the population, although not in direct proportion to the density. There is not, perhaps, a more remarkable table in Dr. Farr's book than the following, which shows at a glance how the death-tax, as he terms it, rises with the density of the population, and the column showing the proximity of person to person in yards, when looked at in the light of the mortality rate in the next column, exhibits with painful reality the effects of overcrowding. It must, of course, be borne in mind that such proximity is only the average, and not the real, proximity, as the calculation includes the cellars in which the unfortunate inhabitants are literally huddled together, as well as the palatial mansions where they are many yards apart; it combines such districts as Seven Dials and Lambeth Marsh with the residences in Kensington Palace Gardens, and therefore gives but a faint idea of the reality of the evil which produces such disastrous results. The table shows, under seven divisions, the density of the population of England and Wales in various districts, and the observed mortality to every thousand persons of all ages :—

No. of group.	No. of districts in each group.	Range of Mortality.	Density—persons to a square mile.	Density—proximity in yards.	Observed mortality per 1,000.
England & Wales, exclusive of London.. ..	593	—	315	107	22·00
I	53	15—17	166	147	16·75
II	345	18—20	186	139	19·16
III	137	21—23	379	97	21·88
IV	47	24—26	1,718	46	24·90
V	9	27—30	4,499	28	28·08
VI	Manchester	32	12,357	17	32·49
VII	Liverpool ..	39	65,823	7	38·62

This table shows conclusively that the density of population is always found to increase with the mortality, although more rapidly; or, as Dr. Farr plainly puts it, "the greater the proximity of man to man, the greater the mortality." But the relation of density to mortality, and *vice versâ*, is not the same at all ages, the effect of density in raising the mortality decreasing, as might have been expected, in the later periods of life, when persons are less prone to receive infection. The mortality increases most noticeably in proportion to density in early childhood, and at the age of 65 it sensibly diminishes. The general results of the investigations in this direction go to prove that, after every allowance has been made, the power of resisting the noxious influences at work in the most thickly-peopled districts is greatest at puberty, least in childhood and manhood. At the same time, while the groups of districts with the highest rate of mortality are the most densely populated, the converse does not always hold good, the least densely populated districts not always showing the lowest rate of mortality. The explanation of this apparent anomaly is to be found in the unhealthiness of certain sparsely-populated districts, owing to natural causes, such as the prevalence of marshes, &c.

Leaving the effects of density of population, and turning to the diseases which are most pregnant with fatal results at the various periods of life, we have some very striking results. Taking a million children born alive in England, we find that in the first five years the deaths from all causes are 263,182. Of these, 87,099, or about one-third, are due to what are technically termed zymotic diseases, small-pox, measles, scarlatina, diphtheria, whooping-cough, typhus with enteric and common fever, and diarrhœa and dysentery, and of these nearly one-fourth are due to diarrhœa and dysentery, a fifth to scarlatina, an eighth to measles, and about one-sixth to whooping-cough. Out of the remaining two-thirds of the mortality (about 176,000), more than one-half is divided between diseases of the brain and diseases of the lungs, upwards of 40,000 children dying from each of these causes under five years of age. Whooping-cough is at its maximum as a cause of death in the first year, measles in the second year, scarlatina in the third and fourth. The deaths of the boys in the

first five years of life are so largely in excess of the girls that their excess in the birth list almost disappears, and at the fifth year boys and girls are nearly equal in number. This is shown by the following figures :—

	Births.	Deaths. 1—5 years.
Boys	511,745	141,387
	to	to
Girls	488,255	121,795

The excess of boys born over girls is thus shown to be 23,490, and the excess of boys' deaths over girls is 19,592, so that at the fifth year the excess of boys living is reduced to 3,898. It may be interesting to add here a table to show the relative death-rate during the first five years of existence of every hundred children born alive in the chief European countries :—

Country.	Deaths, per cent.	Country.	Deaths, per cent.
Norway	17	Prussia	32
Denmark	20	Holland	33
Sweden	20	Austria	36
England	26	Spain	36
Belgium	27	Russia	38
France	29	Italy	39

Proceeding with our examination of the chief causes of mortality, we find that, on entering the sixth year, out of the million children with whom we started, only 736,818 remain; and of these, in the next five years, 34,309 die; 8,743, or one-fourth, from scarlatina, 4,036 from other forms of fever, 1,364 from diphtheria, and from miasmatic disease, 19,256. At the beginning of the tenth year, out of the original 1,000,000, the survivors number 702,509, and from this age to 15 there is a noticeable decrease in the rate of mortality. The deaths between 10 and 15 amount to 17,946, of which, no fewer than 3,526, or one-fifth, are due to consumption (phthisis), and nearly another fifth to fevers, including 1,901 from scarlatina. With these reductions, the army of the million stands at 684,563 on the entry of the fifteenth year, when the mortality among the women begins to show a large increase. The deaths in the next five years number 21,813, and of these, upwards of 9,000, or nearly half, are from phthisis, to which the females contribute 5,263. The growth of this disease among young women, Dr. Farr attributes—and probably with only too much justice—to the tight-lacing, which interferes with respiration, and to their in-door life. At this period, among the males, the active engagements of life begin to show their influence by the number of violent deaths which, between 15 and 20, reaches 1,387. Suicide and insanity also begin to take a prominent place in the death factors. At 20, the number of the million remaining is 662,750, of whom 28,705 die before their twenty-fifth year, and of these, 13,785, or

nearly half, die from phthisis, while fever is another prevailing cause. At 25, the number living stands at 634,045, and from this period to 35 (ten years), there are 62,052 deaths, 30,592 being men, 31,460 women. Phthisis is again the most fatal complaint, causing 27,134 deaths. Fever is gradually losing its power, but causes 4,197 deaths. At 35, the number living is 571,993; and from this age to 45, the deaths are 69,078, 35,142 men and 33,936 women. Phthisis again is the chief cause of mortality, and lung diseases are also fatal. Suicide increases, and gives 564 deaths, while the general return of violent deaths also rises largely, and stands at 3,280, of whom 2,907 are men and 373 women. At 45 years of age, our million is reduced to nearly one-half, the survivors numbering 502,915. Before 55 is reached, the deaths number 81,800; phthisis causing 16,468, a fifth of the total, lung diseases 13,203, and the other organs gradually wearing out with increasing age contribute their quota, heart diseases with dropsy causing 10,041 deaths, brain diseases 9,313, and diseases of the digestive organs 7,917. Suicides increase to 803, and there are 2,876 violent deaths. In this ten years, cancer claims no fewer than 4,583 victims. At 55 the million is gradually dwindling away, only 421,115 remaining, and of these the women are now beginning rapidly to out-number the men—the proportions having been equal at the age of 53. Of the 421,115, before another ten years have passed away, 112,086 have gone. Among these, diseases of the lungs cause the chief mortality, amounting to 23,659, diseases of the heart standing next with their tale of 17,081, diseases of the brain with 15,678, and the diseases of the digestive organs with 11,400. This is the period when suicide is most common, and rises to 826, while the violent deaths give a total of 3,155. At 65, the survivors of the million number 309,029; and in the next ten years are reduced almost by one-half, the deaths being 147,905. The decaying organs cause nearly two-thirds of the mortality, 92,391 deaths being assigned to diseases of the brain, heart, and lungs, while 31,405 are referred to that comprehensive and expressive cause, old age. At 75 the band is reduced to 161,124; and before 85, this falls below one-fourth. Of those who survive at 85, it is worthy of note, that more than half have been married and are widowed. Of the 122,559 deaths in the ten years the failing local organs again are responsible for the larger proportion, 51.838 being referred to diseases of the lungs, brain, and heart. Suicide declines to 131, violent deaths fall to 1,691, and the fevers have little power, while 58,905 die simply from lack of vital energy. At 85 the number still remaining is 38,565, of whom 2,153 are living at 95, and 223 at 100; while at 108 the last survivor of the million passes away. And so ends the tale.

If any one is inclined to ask as he looks through this record of the causes which destroy life, *cui bono*? Who is likely to gain by the possession of such knowledge? the answer is ready to hand. Where the child is born in a healthy condition with its

organs in good working order, it is obvious that there is no absolute reason why he should not live to three score and ten, and ultimately die of old age. But here the statistician steps in and by his inexorable laws based on experience, shows that death inevitably occurs even under the most favourable conditions at certain ages and from certain causes before old age arrives, indeed, he can show with almost unerring regularity the diseases likely to prove fatal at the various points of life. But while he does this he does more than this, for, as we have already hinted, he shows how large a proportion of the mortality is due to causes which cannot be termed natural, and how, therefore, preventive action can reduce the death-rate from such causes. If, for example, we take what are termed more truly than pleasantly "filth diseases," we have at work causes of sickness and mortality largely within the power of man to control, and experience shows that it is to these same filth diseases that the exceptionally heavy mortality of crowded districts is chiefly due. "Uncleanliness," says Mr. Simon, "is the deadliest of our present removable causes of disease," and when we turn to Dr. Farr we have a practical commentary on the truth of the text. If there is any class of disease which can be distinctly said to be a filth disease it is typhus and typhoid fever. The deaths from these forms of fever to every million born alive are 28,146 in the healthy districts, 38,107 in all England, and 76,563 in the typical unhealthy district of Liverpool. Thus in the unhealthy districts the deaths from this single form of disease are nearly three times as numerous as in the healthy districts, and twice as numerous as the average of the whole of England. Practically, then, we see here the effect of favourable sanitary conditions in the most marked manner, and if it were assumed that these fatal forms of fever could be exterminated or even largely removed, we should at once lower the death-rate and prolong the average length of the life of the nation. That there is in many localities an absolute absence of any effort to adopt and still less to extend sanitary precautions is proved by the testimony of the medical officers. "There are houses," writes Mr. Simon as recently as 1874, "there are whole villages, there are considerable sections of towns, there are even entire and not small towns where general slovenliness in everything which relates to the removal of refuse-matter, slovenliness which in very many cases amounts to utter bestiality of neglect, is the local habit. . . . . And with this state of things, be it on large or on small scale, two chief sorts of danger to life arise: one that volatile effluvia from the refuse pollute the surrounding air and everything which it contains; the other, that the liquid parts of the refuse pass by soakage or leakage into the surrounding soil to mingle there, of course, in whatever water the soil yields, and in certain cases thus to occasion the deadliest pollution of wells and springs. To a really immense extent, to an extent indeed which persons unpractised in sanitary inspection could scarcely find themselves able to imagine, dangers of these two sorts are prevailing through-

out the length and breadth of this country, not only in these slighter degrees but in degrees which are gross and scandalous, and very often I repeat 'truly bestial.'" Nor is the precaution of the use of disinfectants so commonly advantageous as persons often fondly suppose. Districts once allowed to become filthy cannot off-hand be made wholesome by disinfectants; and, therefore, as Mr. Simon points out, in order to reduce that vast amount of preventible disease which has its type in enteric (or typhoid) fever, and in relation to which each individual case of enteric fever that occurs ought to be regarded as having an important local significance, the one essential condition is cleanliness. That one of the chief practical advantages to be derived from such works as Dr. Farr's is the knowledge which may, if ulitized, lead to the absolute saving of human life cannot in the face of such independent testimony as this be denied by any one who has the good of his race at heart; and Mr. Simon with his unrivalled powers of observation states the case with even greater force when he says, "That local sanitary authorities proceeding to act upon this principle, *i.e.*, that cleanliness is the only sure preventive of enteric fever and other filth diseases, with a clear intelligence of what cleanliness really means, and with sincere resolution to enforce it in their respective districts, can, within a few years, reduce by some tens of thousands the annual mortality of England is, I think, at least as certain as that such ought to be the aim of their existence." And if there are any of Malthusian temperament, who, finding that the principle of Malthus is never likely to become sufficiently popular to prevent by natural means the undue multiplication of the human family, would have us regard a filth disease as a means of removing the surplus of our poor population, even to such there is an *argumentum ad hominem* which can scarcely fail to have effect, for the truth enunciated by the Latin poet of death generally is more true of filth diseases than of any other; and, as our national experience in the winter of 1874 so abundantly proved, the palace of the prince and the mansion of the peer are as liable to the dread visit as the cottage of the poorest. Added to this we may cite another important fact which can be corroborated with equal certainty—that the proportion of births to population is greatest where there is the greatest mortality, and consequently that pestilence or excessive mortality does not diminish the sum total of population, or retard its growth. Thus, even appealing merely to the selfish side of human nature, to the law of self-preservation, which is in some cases the only law that is likely to be obeyed to the extent of spending money for the public good, we have in these tables a marvellous power, a lever which if properly used ought to move even the most stolid to set his house in order, and to make the district in which he lives as near an approximation as possible to Hygeiopolis.

Another important element which must ever enter largely into all calculations regarding the probable duration of life is that of occupation. The nature of a man's work, the atmosphere

in which it is done, the demands which it makes on his intellect, and the freedom from care which its results, in the shape of income, give him whether for himself or for his family, must ever form an important factor in determining the probable course of life under otherwise favourable conditions. Looked at in this light certain classes of the population, and especially the members of certain professions, enjoy a favourable position when compared with their brethren. The clergy, using that term in its widest application, enjoy a low rate of mortality from the age of 25 to 45, attributed by Dr. Farr to the fact that they "lead a comfortable, temperate, domestic, moral life," and their lives are good in the insurance sense, while, he adds, "that the young curate compared with the young doctor has less cares." The mortality of Roman Catholic priests after the age of 55 is high, and this, Dr. Farr suggests, is due to their celibacy. Physicians and surgeons appear to suffer considerably in the first 20 years of their professional life, but after 45 their mortality is little above the average. A few figures showing the rate of mortality between the ages of 25 and 55, when the influence of profession is most felt, will make this more clear :—

Profession.	Mortality, per cent.			
	25—35.	35—45.	45—55.	55—65.
Clergyman	·465	·628	1·324	2·270
Protestant Minister	·583	·730	·933	2·460
Roman Catholic Priest	·766	·925	·962	4·898
Barrister	·475	·653	1·364	2·446
Solicitor	·890	1·346	1·930	3·059
Physician	1·287	1·474	2·047	3·046
Chemist, &c.	1·177	1·704	1·841	3·357
Schoolmaster, &c.	·891	1·117	1·493	3·628
Civil Engineer	·944	1·531	1·049	2·217
Sixty-two selected classes ..	·973	1·328	1·965	3·500
Of all classes	·985	1·305	1·853	3·215

From this it will be seen that the clergyman heads the list of the professions, and it may fairly be supposed that this is largely owing to his open air exercise, the change of scene, and we may add the fact that his occupation, though laborious, is for the most part self-chosen, and is, therefore, in accord with the tastes of those who pursue it. The mortality of the Roman priests is higher than the Anglican at all the periods except between 45 and 55, but the advantage gained in that period is lost between 55 and 65, when the mortality is more than double that of the Anglican clergy. Another profession with a low death-rate is that of the bar, and this in its turn contrasts very favourably with the other legal calling, the mortality among solicitors being far higher. One of the most healthy of the so-called trades is that of the publishers and booksellers, with whom the rate of mortality is below the average at almost every decennial period of life. Bookbinders and printers, on the contrary, are

subject to a high death-rate, owing in a great degree to the trying nature of their occupation and the poisoned atmosphere in which it is in so many cases carried on. In some of the large printing establishments of the metropolis an effort is now made to provide ventilation without draught, and to carry off the noxious fumes of the gas, which, as a rule, is burning within a few inches of the compositor's face; but these are still the exception, and any one who visits an ordinary printing office or a bookbinding establishment and contrasts it with the publisher's shop or warehouse in which the fruits of the printer's work are sold, will easily appreciate the cause of the following remarkable divergences :—

Trade.	Mortality per cent. at certain ages.			
	25—35.	35—45.	45—55.	55—65.
Bookseller, publisher	·769	·975	1·803	2·430
Bookbinder	1·010	1·649	2·124	4·834
Printer	1·068	1·669	2·424	3·968

Among the most unhealthy of the trades are the publicans, the butchers, and the tobacconists, as will be seen from the following :—

Trade.	Mortality per cent. at certain ages.			
	25—35.	35—45.	45—55.	55—65.
Publicans, Inn and Hotel Keepers, &c.	1·449	2·044	2·859	4·303
Butchers	1·005	1·732	2·245	3·745
Tobacconists and Snuffsellers ..	1·222	1·456	1·566	3·423

From such figures as these the advocates of temperance and the members of the British Anti-tobacco League may, not without justice, gather support for their crusade, and Dr. Farr is not slow to express his conviction that the results here shown are attributable to the habit of excessive, or perhaps it would be more just to say, of constant drinking, smoking and snuff-taking. After referring to the high death-rate noticeable among innkeepers and publicans, the doctor says :—"They might themselves institute a strict inquiry into its causes. But, there can be little doubt that the deaths will be found to be due to delirium tremens and the many diseases induced or aggravated by excessive drinking. It seems to be well established that drinking small doses of alcoholic liquors, not only spirits, the most fatal of all poisons, but wine and beer at frequent intervals without food, is invariably prejudicial. When this is carried on from morning till late hours in the night, few stomachs, few brains, can stand it. The habit of indulgence is a slow suicide. The many deaths of publicans appear to prove this. Other trades indulge in the publicans' practice to some extent and to

that extent share the same fate. The dangerous trades are made doubly dangerous by excesses." Dr. Farr adds, in reference to the fact that tobacconists and snuff and tobacco manufacturers suffer very much at all the younger ages: "this indicates clearly enough how prejudicial smoking is to young men." The butcher's life has for some years been shown by the returns to be exceptionally unhealthy, and especially is this the case in London, owing to the existence of many private slaughter-houses. Fishmongers also share this unfortunate tendency to an excessive death-rate at all ages. There are, however, among the industries which give occupation to so many of our people, cases where the death-rate is even higher than among the publicans, as, for instance, among the earthenware manufacturers the grinders of tools, the needlemakers, and the copper-manufacturers, as will be seen from the following table :—

Trade.	Mortality per cent. at certain ages.			
	25—35.	35—45.	45—55.	55—65.
Of all classes	·985	1·305	1·853	3·215
Earthenware manufacturers ..	·708	2·009	3·367	5·804
Tool grinders	1·136	1·495	2·680	5·033
Needle makers	·950	1·912	2·160	3·972
Copper manufacturers	1·098	1·422	2·017	5·426

In all these cases, as will be seen by a comparison with the average of all classes of occupation given in the first line, the death-toll is above the normal rate, and in some cases nearly double, thus proving the necessity, especially in the potteries, of some legislative or other efforts to improve the condition of the workers similar to that which Lord Shaftesbury made in the wool, silk, and cotton manufactories, and the result of which has been a remarkable improvement in the health of both the male and the female artisans. Among the healthiest employments we find, as we should expect, the out-door occupations, such as those of the farmers and agricultural labourers, gamekeepers, wheelwrights, and workers in wood in general; although Dr. Farr complains that in these employments the higher parts of the brain are not called into sufficient activity. The following table will give some idea of the relative healthiness of these favoured classes of the population :—

Occupation.	Mortality per cent. at certain ages.			
	25—35.	35—45.	45—55.	55—65.
Of all classes	·985	1·305	1·853	3·215
Farmers	·884	·901	1·253	2·339
Out-door labourers	·872	1·080	1·507	2·734
Gamekeepers	·510	·709	·883	2·596
Wheelwrights	·708	1·000	1·701	2·742
Carpenters and joiners	·849	1·073	1·603	2·968

In each of these modes of life, in striking contrast to those previously mentioned, the rate of mortality is considerably below the average of all occupations and gives a direct illustration of the importance of free access to fresh air and of the value of a country life. Indirectly too, such figures form a standing argument in favour of the annual holiday and the occasional "outing" which the city worker so dearly prizes and which must of necessity be doubly valuable to those who pass the majority of their days and even nights in closely confined neighbourhoods where the pure air so seldom permeates. As evidence *per contrâ* of the bad effects of close and impure air we may take the case of the metropolis itself, which although very far from being one of the unhealthiest of our great cities has in it elements which are peculiarly fatal, especially among men of certain ages. The mortality in London in 1841–50 among the population of all ages was 25 per 1,000 and 24 from 1851–70. The mortality of children under five years of age is higher than it is in any other division of the United Kingdom, except the North Western, including Lancashire and Cheshire, but it is lower than that of many other large towns. The mortality of women above 45 is also higher, but the most remarkable feature is the high mortality of men above the age of 25. In all England the mortality of men between 35 and 45 is 1·346 per cent.; in the Eastern counties it is 1·035; in the North Midland counties it is only ·993; but in London it reaches 1·714. And again, between 45 and 55 the mortality in all England is 1·916 while in London it is 2·568. The cause of this excessive death-rate is clearly shown by Dr. Farr's exhaustive tables from which it appears that it is almost exclusively due to phthisis (consumption) as will be seen from the following comparison :—

	Death rate per 1,000 living between 45 and 55.	
	All England.	London.
Phthisis	3·860	6·380
Lung diseases	3·500	4·843
Phthisis and lung diseases ..	7·360	11·223

The explanation of this marked difference has never yet been fully given, but apart from the influence of the smoke and dusty particles which irritate the bronchial tubes and interfere with respiration, and hence cause lung diseases, Dr. Farr attributes it to the lack of cleanliness, especially among the working population. Thus we are brought back once more to the great fact which meets us at every turn that filth whether of mind, body, or estate is the great creator of evil, the great propagator of disease.

We have then, we believe, in the facts we have placed before the reader not only furnished information which is interesting and suggestive to individuals, but which when supported as

it is by the evidence of Government officials has a claim upon the attention of the nation. The tale we have told has indeed no air of novelty. It is in effect only equivalent to the burden of the report of the inspectors nominated by the Poor Law Commissioners after the fever epidemic of 1837, in Spitalfields, when Dr. Arnott, Dr. S. Smith, and Dr. Kay, were directed to enquire as to the "removable causes of disease." Their answer given with promptness in their report dated the 12th of May, 1838, coincided very nearly with that of Dr. Farr and Mr. Simon, for they reported the chief causes at work to be bad drainage and bad ventilation, and they proceeded to recommend to Lord John Russell "the urgent necessity of applying to the legislature for immediate measures for the removal of those constantly acting causes of destitution and death. All delays" they said, "must be attended with extensive misery; in a large proportion of cases the labouring classes though aware of the surrounding causes of evil have few or no means of avoiding them and little or no choice of their dwellings." One of the fruits of the physicians' recommendation was an exhaustive enquiry conducted by the Assistant Commissioners of the Poor Law Board, the results of which were tabulated in a report by Mr. Chadwick, who in the letter-press attached to it used every illustration he could introduce to show the importance of the subject. Taking the year 1838 as a specimen he showed that the deaths from diseases caused by the physical circumstances under which the population was placed amounted to 54,461, or an annual loss equivalent to the reduction which would be made in the population if Westmoreland or Huntingdonshire were every year to be depopulated. There was, too, another point in Mr. Chadwick's report, which may fitly receive prominence at the present moment inasmuch as it appeals to the wealthier classes to support and encourage sanitary reform on economic grounds. He showed conclusively then,—and the case is just as strong now,—that much of the premature widowhood and orphanhood of the poor can be traced to preventible causes, so that it becomes the national wisdom as well as the national duty to take such steps as will keep the father and the brother as the head and stay of the family as long as possible, and thus save the country the burden of maintaining those who when left in want become the care of the state. If, too, regard is had to the sources from whence the inmates of our prisons and reformatories are drawn, the testimony all tends in the same direction, and what Mr. Chadwick wrote now nearly 30 years ago so forcibly sums up the whole matter that we cannot improve upon his words: "Noxious physical agencies, depressing the health and bodily condition of the population, act as obstacles to education and to moral culture; in abridging the duration of adult life they check the growth of productive skill and abridge the amount of social experience and steady moral habits; they substitute for a population that accumulates and preserves instruction, and is steadily progressive, a population young, inexperienced, ignorant, credu-

lous, irritable, passionate, dangerous, having a perpetual tendency to moral as well as physical deterioration."

That much has been done will be gladly admitted by all students of the history of the sanitary reform of the past half century, but with a basis of operation such as is supplied in the Government blue books, it is palpable that much more ought to be done. The burial of the dead in our large towns has been prohibited: it remains to exclude from within the walls those fertile causes of death—dirt and disease—to which Professor Tyndall joins with the statistican in pointing as the great factors in the destruction of life. As an incitement to further effort in this direction—an effort which will entitle the statesman who makes it to the highest honour not only from the people of his own day but from succeeding ages—appeal might be made to the best of all motives, to the teachings of political economy, and even to the lower impulses of self-love, but there ought to be little need for such arguments in days like these, for the chain of evidence is so complete and the inferences from that evidence are so obvious that nought remains but to complete the task already begun. And, as it is carried forward, there will be this satisfaction for its promoters, that year by year the fruits of their labours will be evident until the end will crown the work when the state has not only seen that every child is provided with a liberal education, but that it is supplied with fresh air, pure water, and an abode so constructed as to render it possible to maintain human life within it under tolerably favourable conditions.

How far we still are from such a happy condition of affairs, those whose work it is—whether as clergymen, medical men, or lay visitors—to minister to the wants and relieve the necessities of the poor in our great cities can fully testify; but it is satisfactory to find that modern legislation is being directed towards the provention of that overcrowding in houses positively unfit for habitation, which is one of the most fertile causes, of evil, physical and moral. The diffusion of information on sanitary questions among the middle and upper classes of society—a work of scarcely less importance than the improvement of the dwellings of the poor—is being gradually accomplished by means of letters from eminent sanitary authorities in the *Times* and other newspapers; and the "leader writers" of the chief of our daily journals have of late rendered valuable aid by enforcing the principles suggested by their correspondents. With such helps to progress, and the sterner lessons of the epidemics of small-pox and typhoid fever to stimulate action, it is scarcely too much to hope that attention will be given to this great national work, and that it will at last be carried to a successful issue.

CHARLES MACKESON.

SILVER MONEY.

A PHENOMENON, which has for some years been observable in the monetary world, has at length, in the last two or three years, reached a serious point: the decrease in value of Silver. The importance of any considerable disturbance in a monetary medium need scarcely be dwelt upon. Money, like the fluids of the natural world, has its currents, and its laws which those currents obey; it is, perhaps, comparable, more than to anything else, to the course of water under and through the soil, here percolating freely through gravel or sand, here turned aside by solid rock, here half absorbed by a retentive clay; bubbling up sometimes in springs, but for the most part pursuing its many devious courses unseen, blindly perceived, and imperfectly understood. Much thought has been expended on the phenomena of currency, and many abstruse works have been written upon it; but as a science the study of money is scarcely more forward than the study of hydro-geology. It is not with an intention of evolving an axiom, or suggesting a course, much less of elaborating a theory in a matter so abstruse, that this short review of some recent phenomena in regard to money, and more particularly the depreciation of the value of Silver which is the salient monetary fact of the last few years, is undertaken; but rather with the intention of marshalling the main facts of the case, for the formation by the reader of an independent judgment.

What is meant by depreciation of Silver is, roughly speaking, the fall of its exchangeable value with gold; and yet not with gold alone, though this is its best measure; for it needs scarcely to be said that if a commodity falls in exchangeable value with gold, its exchangeable value with all that gold can purchase falls at the same time. It is, colloquially speaking, worth less.

The chief facts in regard to the fall in the price of Silver are as follows. Going back ten years or so, it may be adduced that in 1866, and about that time, the yearly average of the price of bar Silver per ounce standard was 61½*d.* There was no great depreciation for five or six years, the average price from 1867 to 1872 having been 60½*d.* But after this began a steady and rapid decline: the yearly average in 1873 was 59¼*d.*, in 1874 it was 58⅛*d.*, and in 1875 it was 56⅞*d.* The rate of fall subsequently increased with surprising rapidity; and in the first half of 1876, the price of Silver fell successively to 56⅛*d.*, 54⅞*d.*, 54¼*d.*, 54*d.*, and 52*d.*, coming in June to a minimum of 50*d.*, the whole result being a fall of about a shilling an ounce during the ten years, or something like 17 per cent. Nor was this the lowest point: on the 5th July 1876 the price was but 48¼*d.*, carrying the depreciation to 20 per cent.

The causes of the phenomenon we are considering are by no means occult. Nothing less intelligible than increased supply need be adduced as the principal reason for the fall of price, though other circumstances have contributed to, modified, or lessened, the operation of the main cause. Like everything else,

Silver obeys the laws of supply and demand: it is found and published of late in greater quantities, and the price goes down because there is no adequate increase in demand for the commodity. The discovery and development of new Silver mines of great productivity in the State of Nevada is the one great reason why Silver is worth less than it was; though there are secondary causes to be noticed presently.

The statistics representing the progressive increase in the production of Silver, as given by a Parliamentary Committee of last session are remarkable, and enough in themselves to solve any surprise in our minds at the revolution in value which has come about. Sir Hector Hay, a well known dealer in bullion, supplied this committee with figures showing the following facts:—

In the period 1852–62 the annual production of Silver is estimated to have ranged between eight and nine millions of pounds worth. It is believed to have been

	£
In 1862	9,040,000
1863	9,840,000
1864	10,340,000
1867	10,845,000

Then there was a slight decrease: in a few years production revived, and the amounts were:—

	£
In 1871	12,210,000
1872	13,050,000
1873	14,050,000
1874	13,500,000
1875	14,200,000

Concisely put, production grew from eight millions before 1862 to fourteen millions in 1875.

Since 1870, the entire increase of production is accounted for by the increased quantities of the metal discovered and got out in the United States. The yield of the New Nevada mines is now nearly as much as that from all the rest of the world put together. Mexico and South America, the historical sources, produce steadily some £6,000,000 worth, or nearly half the latest total supplies; other countries, excluding the United States, produce about £2,000,000: the following are the statistics of recent production in the United States:—

	£
1859	20,000
1860	30,000
1861	400,000
1862	900,000
1863	1,700,000
1864–9 .... average	2,325,000
1870	3,200,000
1871	4,600,000
1872	5,750,000
1873	7,150,000
1874	6,400,000
1875	6,400,000

Compressing a large body of figures bearing upon the subject the total production of Silver in the world may be stated as under:—

Previous to the discoveries in the United States:—

Mexico and South America	£6,000,000
Other countries	2,000,000
Total per year	8,000,000

In the years 1864–7, when the yield in the United States had considerably developed:—

United States	£2,300,000
Mexico and South America	6,000,000
Other countries	2,000,000
Total per year	10,300,000

In the year 1872:—

United States	£5,750,000
Mexico and South America	5,200,000
Other countries	2,000,000
Total for the year	12,950,000

In 1874:—

United States	£6,400,000
Mexico and South America	5,000,000
Other countries	2,000,000
Total for the year	13,400,000

Of these three items the first goes on increasing.

The recent discoveries in the United States of highly productive mines have mainly been on the so-called "Comstock Lode" on the Pacific coast, a "lode," or lead, surpassing in extent and richness anything ever met with even in the days of Pizarro. Of these the newest and richest group are the "Consolidated Virginia," the "California," the "Best" and the "Belcher." It is this deposit of buried wealth which is chiefly responsible for the "depreciation of Silver." Out of this group of mines comes something like 500 tons of ore per day, and a moderate estimate makes the ore worth 150 dollars a ton: consequently these mines alone add about £5,000,000 worth of precious metal to the world's stock. No wonder that, in so doing, they lower the value of Silver; and this they would do still more, were it not that with the Silver comes a very good proportion of gold. The bullion, in fact, from the "Comstock Lode" comprises nearly as much value in the form of gold as in the form of Silver, the latter very greatly predominating, of course, in quantity.

Some brief account of these extraordinary sources of Silver and gold will not be out of place. The surface of the whole country round Virginia City is stated, in an official report by

Professor R. E. Rogers to the Director of the United States' Mint, to be rough, broken and hilly. There is here an extension of the Washoe Mountains, about half way up the slope of which the "croppings" of the ore are visible. Excavations were first made at these outcroppings; but it was soon found that the ore dipped from 40 to 47 deg., and a shaft was sunk, (that of the mine now known as the "Consolidated Virginia") some hundreds of yards from the outcropping, in the direction of the dip. As was expected, no ore was come upon till the shaft had reached a depth of about 1,300 feet. Here occurred ore of profitable quality; but 100 feet lower it was found richer still; another 100 feet brought to knowledge something still better at 1,500 feet depth, and finally a "double winze" was sent down to a level of 1,660 feet. Galleries and cross-cuts were then run, and the extent of the metalliferous mass approximately ascertained. The "Consolidated Virginia" and the "California" mines are two in name, but the line which divides them is only a property boundary, there being two companies, but under one management. The ore is of the same character in both. The explored width of the ore-mass averages 250 feet at the 1,500 feet level, and at a very moderate estimate the total ultimate yield of these mines is expected to be £16,500,000 worth of Silver, and gold to the value of something like £13,500,000 in addition! Still they are only what are called "pockets;" it is not expected, that is to say, that they will be productive for many years.

So much for the increased supply of Silver. It must be noted under this head that, notwithstanding the largely extended production in the United States, there has been little or no increased export from that country. This fact has been dwelt upon by some as showing that the discoveries in Nevada cannot have had a depreciating effect. But it must be remembered that absence of increase in actual export is not necessary for the influence of the increased supply to be felt. Prices fall whenever it is known that production has largely increased, although increased quantities may not be actually brought to market. This is a familiar every day phenomenon in the money and stock markets.

Passing now from the increased supply of Silver to the decreased demand which has been coincidently operating, it will be found that one of the greatest of the latter class of causes of depreciation has come about in connection with India. On this head figures may be adduced representing sufficient to account for nearly half the actual recent depreciation of the metal. It appears that of late years the India Office at home has been drawing and selling bills on India to a much larger extent than formerly. These bills are bought in England by merchants, and remitted to India in payment of trade accounts, instead of sending actual Silver coin. Paper takes the place of metal, and thus the demand for the metal undergoes a diminution. The extent to which this cause has been in operation will be shown by the following figures.

There were remitted to India between 1868–9 and 1871–2—

In Treasure	£40,000,000
In Government Bills....	£29,500,000

Between 1872–3 and 1875–6 the amounts were as under—

In Treasure	£16,500,000
In Government Bills....	£50,500,000

How entirely the proportions have been reversed will be seen at a glance. Of late years the amount of bills on India which the home government has to sell has averaged £15,000,000 a year, whereas they used to average £4,000,000. The disbursements of the home government repayable by India have risen, since the mutiny, from about £5,000,000 a year to about £15,000,000. As long as the repayment is made by the home authorities drawing bills upon India, (and selling them to merchants for use in settling trade balances due to India), so long will there be a proportionate decrease in the demand for Silver to send to India. Inasmuch as the increased amount of these bills represents more than half the amount of Silver annually produced, it will be seen how largely this change in Indian transactions may be held to affect the market value of the metal.

India, however, it is expected, will increase to some extent her demand for Silver as time goes on. It is not, perhaps, likely that the diminution of that demand through the sale of government bills will materially alter, as the figures just quoted appear to represent the normal amounts for late years; but it is believed that a recovery may take place in two ways; 1st, the use of Silver currency in the remoter parts of India is extending where hitherto the people have been content with the primitive operation of barter; and 2ndly, the demand for Silver for manufacture into ornaments—always considerable in India—is likely to increase as the price of Silver falls. Here, as in the other cases, there is visible a counter current: the depreciation of market value has a tendency to react upon price through the encouragement it gives to demand. India has always been a great absorbent of Silver. Either because its use as currency is constantly extending, or from its employment in manufacture in the country, the surplus of imports over exports has been in the last 40 years something like £200,000,000. The export has always been very small indeed. A great deal is believed to be hoarded, either by actual storing away or by conversion into family jewellery. In every large village of India there is a silversmith, or worker in Silver; and as soon as a native of a certain class acquires wealth he sends for the silversmith, who brings his tools and makes the money into ornaments. Although the Indian peasantry have poor houses, the value of the ornaments they possess would in many cases exceed that of the furniture of the same class in more civilized nations. The demand for the metal for other purposes than those of currency is in fact great to an extent quite unknown in European countries. The habit is shown by the statistics of gold. There is but little use for

gold as money in India, and yet the surplus of gold imports into the country during 40 years has been no less than £100,000,000.

Besides this large effect of Indian fiscal arrangements, there must be taken into account the fact that several other countries have recently adopted measures which have had the effect of decreasing the demand for Silver. And first, Germany has substituted gold for Silver in her currency. This operation commenced at the end of 1871. Germany has also recently effected another monetary reform, having its bearing upon the value of the precious metals, *i.e.*, the withdrawal of all bank notes of a lower figure than 100 marks (£5). The bank notes for small sums (as low as 3*s.*) which used to be common, had their origin in the inconvenience of making payments of even moderate amounts in Silver coin, as was legal under a system of a Silver standard for coinage.

The history of the recent monetary changes in Germany is interesting, both in itself, and as throwing light, when considered with other causes, on the change in the value of Silver. The general effect of what has been done in Germany during the last five years in regard to coinage is to establish, as just mentioned, gold as a standard instead of Silver. The first series of steps were preliminary, and were effected by a law dated 4 December 1871. This Act authorized the manufacture of a gold coin for the German Empire of which 139½ pieces were to be minted out of one pound of fine gold. It will be seen that this is a very close approach to the English half-sovereign. It was divided into 10 Silver marks, corresponding closely to our shilling, and a gold coin of 20 marks was authorized, which is much the same as our sovereign. Existing Silver coins were not demonetised by this law, but it expressly referred to their prospective withdrawal, and it did actually stop the manufacture of any more large Silver coins. All existing Silver coins, nevertheless, remained legal tender.

In July 1873 the operations contemplated by the first Act were carried further, and completed by another. This prescribed unreservedly a gold standard, in place of all the existing coinages of German States, the 10 and 20 mark gold pieces already in circulation by virtue of the law of 1871 being its bases. A five mark gold piece (value about the same as an English crown) was added to the gold coins; and Silver pieces of five marks, two marks, and one mark were issued. The new Silver coins, however, were no longer made intrinsically up to their nominal value, and the Silver currency thus fell into the position of a subsidiary coinage. Its position was further subordinated to the new gold coinage by an enactment that the new Silver coins were not to be legal tender beyond the limit of 20 marks. The coining of all the previously existing multifarious Silver coins was stopped. Finally all bank notes couched in other than the new imperial currency were ordered to be withdrawn by the beginning of 1876, and for the future all bank notes were to be in the terms of the imperial currency, and not of less amount than 100 marks.

It will not fail to strike the English reader that these changes virtually assimilated the German to the English currency, the new "mark" being very close to a shilling in value, and the other coins being similarly equal, the 20 mark gold piece to a sovereign, the 10 mark gold piece to a half-sovereign, the 5 mark piece, gold or silver, to a crown, and the 2 mark piece to a florin.

Our present purpose, however, is more with the effect of the alterations upon the market value of Silver. It appears that, as a consequence of the changes, the German Government had sold Silver to the amount of £6,000,000 at the end of April 1876. This operation necessarily had its effect in reducing the price, and as the change was not completed, there remained further sales, and probably a further depreciation. But it does not appear clear that, after all, Germany will have much further Silver to sell. In the first place, less of the new Silver coin was manufactured than the best authorities think it likely will in the end be required. It was officially estimated that, under the new gold standard, it would be sufficient to issue Silver subsidiary coins to the extent of 10 marks (say 10 shillings) per head of the population. Considerably more than this is in use in England; and it is said that the habits of German domestic life, where prompt payment for small purchases is the rule, make more Silver small coinage necessary than in this country. Accordingly it is expected that, as the old Silver currencies get more completely retired, new Silver coins will have to be provided beyond the calculated extent of 10*s.* per head of the population, especially as the issue of the smaller bank notes has been stopped. On the whole therefore, it is thought that the chief effect upon the Silver market of these changes in Germany has already been experienced, and that the new empire will not have much more Silver to sell.

One curious occurrence in connection with the depreciation of Silver took place in paying the French war indemnity to Germany. Out of the total sum of £200,000,000 paid by France to Germany as part of the price of peace, about £10,000,000 was paid in Silver 5 franc pieces; and it is an interesting and remarkable circumstance (as mentioned in the Report of the recent Parliamentary Committee on Silver) that out of these £10,000,000 nearly £4,000,000 were coined out of Silver bought on French account in Germany, and imported into France for the express purpose. The price of Silver having fallen in Germany, 92,000,000 francs worth was procured of the Bank of Hamburg, and coined into 5 franc pieces, which, under the terms of the Treaty arrangements, were taken by Germany at par. Thus only a balance of £6,000,000 passed into Germany from France. It is believed, from the accounts of the receipts of Silver at the Bank of France that the whole amount, in obedience to some one or other of the prevailing money-currents, passed back again.

Not only Germany, but the three Scandinavian kingdoms,

Denmark, Sweden, and Norway (the two latter are separate governments, though united for certain purposes) have substituted a gold for Silver currency during the last few years, and thus added to the causes which have combined to cheapen Silver. The Danish government, as a consequence of the adoption of its new monetary system, sold during the period 1873–6 about £850,000 worth of the less precious metal. Sweden made a similar monetary change in 1873; and whereas previously Silver had been imported to an extent considerably exceeding the exports, the balance turned in 1874 and 1875 the other way. Norway introduced a gold standard in 1873 also, and the result is believed to be a discarding of Silver to the amount of about £1,000,000. Altogether the Scandinavian kingdoms have thrown Silver to the extent of £1,800,000 upon the market of the world during the last three or four years.

Another of the minor causes of the phenomenon under notice is an Act passed in Holland stopping for the present the coining of Silver except on government account, and authorising the coining of gold. The amount of disturbance involved has not, however, been great.

It will be seen from the foregoing that two sets of causes have been simultaneously in operation. America has produced Silver in unexampled plenty, while various European governments have taken measures which have led to a decrease in the demand for the metal. That one set of causes, namely increased production, would not alone account for the fall of the price of Silver is proved by the noteworthy fact that the production of the metal as compared with the production of gold is by no means so large as it has been in former times. Three times as much Silver as gold used to be produced in the earlier part of the present century; then, by the discovery of vast new supplies of gold, the proportion fell so that in 1848 there was scarcely produced half as much Silver as of the more precious metal; between 1852 and 1856 only about one quarter as much Silver as gold was produced, and the recovery in production of the inferior metal, large as it has been in quantity, has only brought the proportion up again to a little more than half. Both metals have become very much commoner than formerly, and a phenomenon has resulted with which we are all familiar—a decrease in the purchasing power of both. It is the decreased use of Silver as compared with the use of gold which has perhaps told most in bringing down the value of the former as measured by the latter.

To understand more fully the position and prospects of the precious metal under notice it will next be useful to ascertain and consider its recent general movements under the influence of the two-fold causes of depreciation which have been now fully stated. Such a survey reveals, here and there, counter-balancing causes which must be taken into account in forming a judgment on the whole matter.

The aggregate production of Silver during the four years 1872–5 has been estimated at £54,700,000; the aggregate pro-

duction of the previous four years 1868–71, at £41,500,000. During the earlier four years India took and retained £23,400,000; during the latter four years only £9,100,000. In the earlier group of four years, therefore a balance of £18,100,000 had to be disposed of after India was supplied; in the latter four years the similar balance was £45,600,000, in itself a very large increase. But to this £45,600,000 have to be added £6,000,000 sold by Germany, and about £2,000,000 thrown into the market by the measures taken in the Scandinavian kingdoms. Nearly £54,000,000 was accordingly thrown upon the market during the four years 1872–5, as compared with £18,000,000 in the previous four years; or an excess of £36,000,000. These figures are obviously enough in themselves to account for a serious depreciation. What became of the disposable Silver? The inquiry is important as throwing light upon the future of that metal. The answer may most conveniently take the form of a slight sketch of the operations affecting Silver by other states not yet mentioned in connection with the subject.

Austria, during the last few years, has not been a customer for Silver. On the contrary her monetary policy, as represented by the Imperial Bank at Vienna, has been to accumulate gold, and let the stock of Silver lessen. The following figures will show this. The stock in the Imperial Bank was—

	Guldens.		Guldens.
In 1865, gold,	1,507,000;	Silver,	120,014,000
In 1871, „	44,403,000;	„	99,093,000
In 1875, „	67,854,000;	„	66,562,000

This shows a decrease in Silver of nearly £3,500,000 since 1871, and a very large increase of gold. The same drift of monetary policy is shown by the following figures respecting the imports and exports of Silver by Austria:—

	Imported.	Exported.	Excess of Imports.	Excess of Exports.
	£	£	£	£
1868	1,560,079	1,026,801	535,276	—
1869	1,236,375	504,844	731,531	—
1870	838,455	1,126,819	—	288,364
1871	766,532	2,064,391	—	1,294,859
1872	571,106	3,733,657	—	3,162,551
1873	1,462,835	1,818,478	—	355,643
1874	930,708	1,338,897	—	408,189
1875	896,785	1,021,304	—	124,519

This table shows that for the four years 1872–5 upwards of £4,000,000 worth of Silver was exported more than was imported. During the same period coinage of Silver pieces was almost at a standstill. Austria, therefore, has contributed more than a little to that depreciation of Silver which is under comment.

The recent monetary history of Italy is simple. In April 1866 a forced paper currency was adopted, and whereas there had

previously been a steady influx of Silver into the peninsula, the stream was now reversed. From 1860 to 1865 France exported to Italy £10,000,000 more in Silver than France received from Italy; but from 1866 to 1872 Italy exported to France £27,000,000 more than she received from France. A French commercial return shows that immediately after the introduction of the forced paper currency, that is to say in the years 1866–7, the Silver sent to France exceeded that received by £12,000,000. Even the divisional coinage, intrinsically worth 9 per cent. less than their nominal values, was drawn abroad by the fact that the agio between Silver and paper exceeded that rate. The Italian coinage, being of the same purity and diameter as those of France, Germany, and Switzerland, was freely received at the State treasuries of these countries, and searches made in 1868 revealed the existence of large quantities of the Italian small Silver coins in the coffers of other continental countries. There are no reliable figures extant as to the movements of Silver in Italy during the last few years, but there is no reason to believe the current of import which formerly existed has set in again, or that Italy has in any way absorbed Silver. On the contrary, like Austria, she has thrown quantities of the metal out of monetary employment, and thus become another contributory cause to its depreciation.

Turning to the monetary history of France during the last eight years we have quite another picture. France has absorbed large quantities of Silver, and the depreciation of the metal has gone on in spite of the process. The following figures are extracted from the French official returns:—

		£
Total imports of Silver	1868–71	27,900,000
,, ,,	1872–5	53,700,000
Surplus of imports over exports,	1868–71	10,400,000
,, ,, ,,	1872–5	33,500,000

France imported, that is to say, £26,000,000 worth more Silver in the latter than in the former group of four years; and the surplus of imports over exports was about £23,000,000 more in the latter than in the former of the two periods; the actual balance which this country took off the market in 1872–5 being no less than £33,500,000. Before 1868, it should be stated, the exports had usually exceeded the imports. In that year the imports began to predominate, and this current gradually swelled, with some ebbing and flowing, to the large amount shown above. In fact since 1868 France has increased her stock of Silver by £28,000,000, by taking up sums equal to more than half the total amount of Silver produced. This current, however, is believed to have reached its limit, and the bearing of the fact upon the question of the depreciation of Silver consists in the reflection that the actual depreciation which has occurred has taken place in spite of the large demands of France. These demands cannot be expected to last.

Russia again, has been a customer for Silver of late. There are no complete statistics, but it is known that for the three years

1872–4 the imports exceeded the exports by about £3,940,000; and the returns of the Imperial Bank of St. Petersburgh show £3,000,000 more Silver in stock in 1876 than in 1871. So far, then, as Russia is concerned, her currency operations have tended to keep up the demand for Silver.

Some portion of the large recent supplies of Silver seem also to have been taken by Spain. The following were the exports from the United Kingdom to Spain during the years stated :—

	£
1868	1,000
1869	None
1870	3,036,000
1871	1,054,000
1872	731,000
1873	377,000
1874	1,822,000
1875	1,680,000
Total	8,761,000

A constant, though fluctuating import of the metal is revealed by these facts.

The figures showing English dealing in Silver during the same periods as those taken in relation to other countries alone are large; but the differences are not great, nor are the deductions to be made striking. The following are the main figures :—

	Imports.	Exports.	Excess of Imports.
	£	£	£
1868-71	41,600,000	31,400,000	4,200,000
1872-75	46,550,000	41,600,000	4,950,000

Thus we absorb, it would seem, about £1,000,000 worth of Silver per annum. Of this it is believed about £600,000 worth is used up in manufacture, and the rest in coinage. In relation to the amount consumed for manufacture, it will not be without interest to mention that whereas some persons have suggested the growth of electro-plating as among the causes of the depreciation of Silver, the facts do not bear out such an opinion. Statistics show that the extension of the practice of electro-plating has not decreased the amount of Silver used in manufacture, the use of plate having, it is to be assumed, enormously increased as the electro-plating process made it cheaper. But under any circumstances the quantity of Silver used for manufacture is far too small to disturb the movement of its currents as a monetary medium.

The United States, during the four years 1872–5 produced £26,300,000 worth of Silver, and exported £18,700,000 more than was imported : they have therefore absorbed £7,600,000.

Lastly, China and Japan have, during the same four years, absorbed about £7,500,000 worth of the metal under review.

We may complete the important statistics of this weighty and interesting subject with the following *quasi* balance sheet of the recent transactions of the world in Silver, extracted from the report recently made to the House of Commons :—

Dr.	£
Silver produced, 1872-5	54,700,000
,, sold by Germany and Scandinavian kingdoms ...	8,000,000
,, exported by Italy in excess of imports	8,000,000
,, exported by Austria in excess of imports	4,000,000
Total	£74,700,000

Cr.	£
Taken by India, 1872-75	9,100,000
,, France	33,500,000
,, Russia	4,000,000
,, Spain and Portugal	4,000,000
,, England...	5,000,000
,, United States	7,600,000
,, Japan	7,500,000
,, Other Eastern Countries	3,000,000
	£73,700,000
Balance, or difference unaccounted for	1,000,000
	£74,700,000

On the detailed exactness of these figures, it is evident from the nature of the inquiry, no great reliance can be placed; but many ways of looking at the numbers tend to show their substantial correctness.

The facts of the recent history of Silver are now completely before the reader, and it remains to recapitulate the general bearings of those facts.

The increased production of Silver in Nevada has been shown to be the main disturbing cause: the rest of the movements reviewed tend some to counteract some to assist the operation of this increased production. It must be remembered, however, with regard to the main fact itself, that it seem ascertained that the yield of the new mines is limited and likely to last only a few more years at their late enormous rate.

Passing to the next item in the "Balance Sheet" just given, it may be observed that the partial discontinuance of the use of Silver by Germany has undoubtedly had considerable share in the recent depreciation; and the new empire has still an amount of Silver to throw upon the market which may amount to £20,000,000, or may not exceed £8,000,000, according to the amount which time will show to be required by that empire for new subsidiary coinage. Here, however, again the causes in operation are temporary, and the condition of German currency a transitional one. The operations of the Scandinavian kingdoms are too small to count for much as a disturbing cause.

It is to be hoped, again, that the condition of matters in Italy through which Silver has been of late years thrown out of use by paper, will not be permanent, however little prospect there be at present of a salutary change. No doubt one of the best hopes for the recovery of Silver lies in the anticipation that, should its price continue low, the countries which have a paper circulation for small sums will take advantage of the opportunity to adopt hard for soft money, Silver for paper. Germany, as we have seen, has already done this in regard to the small bank notes

which lately circulated within the empire, but which became extinct at the end of 1875, the silver mark currency taking its place. The United States seem likely to carry out more or less completely a similar step in substituting Silver for greenbacks, and this movement, as has been mentioned before, has absorbed, and may still further absorb, some of the supplies from the Nevada mines. There is a large field altogether for a similar wholesome substitution of hard money for soft; Russia and Austria, as well as Italy and the United States of North America having a paper currency in circulation as legal tender. If the low price of Silver should lead these nations to put their currency on a solid basis the depreciation of the metal will certainly not have been an evil without mitigation. And one of the results must be to raise, in a certain degree, its value.

Turning again to India it would appear likely that the main fact, the increased rate of bills drawn by the India Office at home on the government in India, will be a permnent one. This tells against Silver, as has been already shown.

By far the largest figure on the credit side of our Balance Sheet for Silver is that attached to the name of France. By taking £33,500,000 of the metal during the late period of increased production this country has probably averted a much greater fall in its price than has actually occurred. But it is not at all likely that this demand by France will continue.

Of the remaining items in the statement given above in the form of a balance sheet it is hardly necessary to say more than has already been written in reviewing the facts. The changes are great and frequent in monetary currents, and turn, in the several countries, now one way now another. There seems to be setting in a feeling in favour of substituting gold as a standard, to the prejudice of Silver; and the effect of this policy, if adopted in the countries which have at present—unlike ourselves—a Silver standard, would be, it is calculated, to cause a very much greater depreciation of Silver than we have seen yet. In mitigation of such a result may perhaps be considered the fact that as Silver falls, the motive to produce gold increases. There is perhaps not much in this point, as the motive to educe gold, wherever it can be found, is always sufficient; though some effect must necessarily be produced, as between the two metals, by mining industry turning from Silver to gold.

The reader who has followed thus far the facts brought before him in regard to a great current in monetary matters will have been struck, probably, with an obvious reflection: how is it that there is no effective combination of nations to control, or regulate the effects of, the several causes of disturbance? Much might, apparently, be done in this way by concerted action. No one, of course, would propose to shut up the Nevada mines, or otherwise to interfere with the operation of purely natural causes; but why should the action of nations in affairs of coinage proceed in so entirely isolated a manner, and each separate nation take what steps it pleases, without regard to the general convenience

of the world? The truth is that any action by combination among nations, except in regard to warlike enterprises, is comparatively new to the world, and has not yet made much progress. Under the pressure of such straits as arise in great wars, nations ally themselves together, in groups, for purposes of aggression or defence; but even these unions are but temporary, and begin to melt away as soon as the pressure of the crisis which prompted them has passed: alliance for less immediate and pressing—though far more beneficial—objects is as yet but in its infancy. There are, it is true, distinct signs that the human race will learn, in time, the lesson of common action, irrespective of the divisions called nations, for other than purposes of war. The yearly growth of "conferences" and international exhibitions are manifest signs of an awakening to the knowledge that human progress lies in this direction.

Every year we have a telegraphic congress, a postal conference, a geographical conference, a statistical conference, or a health conference, to which representatives of the more enlightened governments, or nations, resort, and at which some little progress is often distinctly attained. Much has been done, by international action of this kind, imperfect as it has been, in postal arrangements; something, at the time this article is being penned, is being done towards common action of enlightened peoples in regard to statistics; in time, perhaps, some common steps may come to be taken in regard to coinage. Already a beginning has been made, and one of the most interesting matters incidental to the present short survey of the question of Silver Money is the action of a group of governments called the "Latin Monetary Union." Unfortunately there is visible, even in the name of this confederation, an imperfect ability to appreciate the real demands of the situation. We do not want a "Latin" union for regulating national monetary action, any more than we want a Sclavonic monetary union, or an Anglo-Saxon Exchange League; and to have made any such alliance coincident with a limit of race betrays a lamentable want of power to see the matter in its full breadth. A Latin monetary union excludes the Anglo-Saxon powers; this alone stamps it as, if not a mischievous, a dwarfish conception.

Such, however, as this "Latin Union" is, its action has to be taken into account in considering the question under review; and it may perhaps, notwithstanding its congenital defect of "Latinity," be looked upon as a sign that the want of some common action in matters of currency is making itself felt. The "Latin Monetary Union" is a confederation for monetary purposes, of France, Italy, Belgium, and Switzerland. It has been in existence more than ten years, having first held a conference at Paris, in 1865. At this time the inconvenience chiefly felt by the countries concerned was the differences in value of the Silver coins of the several countries which should have been of identical value. In France the fractional coins were all superior in value to those of Switzerland; French pieces of one or two francs

were equal in value to those of Belgium, while the 50 and 20 centime pieces of France were inferior to the Belgian coins of the same denomination. Again, while the French franc was superior to that of Italy the coins of 50 and 20 centimes were equal in the two countries. Speculation turned these discrepancies to profit; French coins were melted down and taken to Switzerland, where the Silver coins were so inferior that they were forbidden acceptance at any public office in France. One of the first principal objects of the Latin Monetary Union was to reduce the Silver coinage of the four countries to uniformity, and thus not only baffle speculators but promote the general convenience of the four nations comprising the union. The common item in the coinage of these nations was and is the franc, and the Latin Monetary Union originated in a proposition by the Belgian government to the French for a monetary convention between the countries in which the franc was the established basis of currency. The result of the first conference was to agree upon common action in regard to the intrinsic value of the divisional coins, a most salutary measure, of which the convenience at once began to be manifest; the monetary members of the "Latin Union" also agreed with each other to place the determination of the amount of coins to be issued by each of the states under the control of the Union, and by virtue of this mutual contract each of the four countries was authorized to issue Silver divisional coins up to six francs a head for the population, according to its presumable increase up to 1879.

Things changed, however; and after a few years came that depreciation of Silver which is the principal subject now under remark. The "Latin Monetary Union" necessarily formed a powerful factor in this matter. Meeting again in January 1876, the representatives of the union had to face this question, and various were the views taken thereon. These, as embodying the present condition of the question generally, and the attitudes of various minds and interests in regard thereto, may be briefly summarized. The Swiss delegates not only supported the continued limitation of the coinage of Silver by the Union, but suggested further limitation, and the adoption of gold as a sole standard. At any rate, it was urged on behalf of Switzerland, the limit fixed for Silver coinage in 1874 should be reduced by half. But both measures were considered to be called for by the great fall in the value of Silver. On the other hand the French delegate considered the superabundance of Silver a chimerical evil, thought it had to some extent been brought about by the "Latin Monetary Union" itself, by that very measure of restricting the Silver coinage which the Swiss representatives wished to see further acted upon. The countries least affected by the crisis, he urged, were those which had the double standard. He could not entertain the proposal for a gold standard put forward by the Swiss delegates. Belgium opposed further restriction of Silver coinage; Italy would agree to, but did not actively support it. Greece,

which had joined the Union in 1868, applied for special authority to issue an extraordinary supply of Silver coins. It was at length agreed to authorize the issue in 1876 of 108,000,000 of francs in the four countries, as against 150,000,000 in 1875, being a diminution of 42,000,000; authority being however given to Greece to coin 12,000,000.

So far therefore as the influence of the "Latin Monetary Union" in the restriction of the use of Silver for coinage is concerned, its action was maintained in the direction which was believed to have already contributed to the depreciation in the value of the metal. Obviously, it is not to the "Latin Monetary Union," or to any other currency league of a few states, that we can look for the power to take such general steps as may be best adapted to cure proved defects in the system of moneys.

There can be no doubt in fact, as already hinted, that, in this matter as in many others, the world is beginning to feel the want of international action. Nothing effectual can be done by any one nation, or any two or three. By some means or other, before such a matter can be brought under control for the common benefit of the human race, nations must learn to act together, or in concert, irrespective of merely national interests. Money, like weather, or water currents, refuses to obey German, English, or French interests; it obeys a wider law, which nations severally cannot alter. Mints may stamp, and monarchs may coin, but money is something greater than kings or coinage; it represents the collective commercial interests of the human race, and can only be effectually controlled by some action in which those collective commercial interests are the motive power. The time may come perhaps when such international action may be possible; nations are, as has been shown, already feebly feeling their way towards it. We are however far off, as yet, from anything like universal combination in such matters. It will come. The interest of mankind tells towards it, and the interest of the kind is a greater thing than the interest of a class or a nation. Enlightenment and knowledge will some day permit the broader interest to have its way, and something like universal coinage, and international direction of money will, in time—supposing the human race continues to progress—be an accomplished fact. The present state of money is radically wrong, because, instead of being treated as a matter of universal, it is treated as a matter of national regulation. Some day, though coins may still bear idealized portraits of kings, identity of weight and fineness will be agreed upon internationally, and nations will be content to stamp their own devices upon pieces otherwise the same, instead of creating confusion by following each its own caprice in regard to weight and value. But till then, such phenomena as the depreciation of a precious metal can be met with no adequate measure for equalizing and minimizing the evil results.

JOHN CROWDY.

THE CHANNEL PASSAGE FROM ENGLAND TO FRANCE.

ALTHOUGH the distance from England to France, viâ Dover and Calais, does not much exceed twenty miles, and is only four or five miles more viâ Folkestone and Boulogne, the voyage is beset with many vexations and personal discomforts. It is by far the shortest and readiest route for reaching the Continent, bringing Paris and London (in virtue of improved railway arrangements lately organized) within a time-distance of ten hours, of which only about two hours are spent on the sea. Yet they are two hours which the majority of passengers are glad to see draw to a close. On many a day may be seen a hundred passengers, or more, endeavouring vainly to secure some degree of comfort on board one of the steamers belonging to the Railway Companies; if the weather is bad, they huddle between decks; women, however refined and delicate, are crowded into what is called the ladies' cabin at such a time, amid scenes of sickness and disagreeables which no one cares to describe. Sea-going steamers are, of course, subject to pitching and rolling in bad weather; but there seem to be special evils of this kind in the narrow part of the English Channel.

About seven years ago, Captain Tyler was directed to examine and report to the Board of Trade on the best means of improving the intercommunication between England and the Continent. He found that, in 1868, the passengers between Dover and Calais numbered 141,669; between Folkestone and Boulogne, 109,066; between Newhaven and Dieppe, 41,371; and between Southampton and Havre, 17,469. The passengers proceeding to Ostend, Antwerp, Rotterdam, Hamburg, &c., we need not advert to, as their sea-voyage is affected by different circumstances of wind, tide, and current; but from England to France, directly across the English Channel, the total number was 309,470, of whom five-sixths crossed at the narrow strait accommodated by the four ports of Dover, Folkestone, Calais, and Boulogne. The passengers have considerably increased in number, as have also the trains and steamboats; but the voyage itself is as comfortless as ever. Captain Tyler reported that, "not unfrequently, the traveller from India, or from America, finds the English Channel the most unpleasant part of his journey; and he sometimes looks forward with more anxiety to the state of the Channel than to the heat of the Red Sea, or the passage of the Atlantic; selecting, in the case of America, a French or an English vessel, in order to avoid the Channel crossing, according to the country which he desires to reach, rather than for any other consideration." The harbour-master at Folkestone has ascertained, by a long and careful series of observations, that only ninety days of really calm weather are met with in an average year, in the busy Strait of Dover. A steamer more than 240 feet long, and drawing more than 8 feet of water, cannot reckon safely on entering the existing harbours at low tide, and in rough weather even smaller

vessels find a difficulty in doing so. Larger steamers would bear the troublesome cross-cutting sea which has so often to be encountered there ; but these cannot be used for the reason just stated. The English and French Railway Companies are sometimes blamed for inconveniences which they cannot help, in regard to the sea-passage.

The meeting of opposing currents and tides, coming respectively from the west and the north, is the cause of this turbulent state of the water. As this cause cannot be removed, civil engineers, shipbuilders, and others, have proposed many ingenious schemes for improving the Channel passage. The most important of these schemes we will briefly describe one by one.

Improving the existing Harbours.—Many suggestions have been made for improving all or some of the four harbours chiefly concerned in the Channel passage, so as to fit them for the reception of larger steamers, doing the voyage in a shorter time, and with less discomfort to the passengers. Captain Tyler, while viewing favourably an extensive scheme to which we shall have to advert presently, recommended an immediate improvement in the existing arrangements. He thought £100,000 might well be spent on Dover Harbour, to enable it to receive and accommodate, at all states of the tide, commodious vessels having both ends alike, so as to steam in and out without turning. On the French side he neither likes Calais nor Boulogne, but fixes upon Audreceilles, a place between them, where a good harbour could be formed, favourably situated in regard to prevalent winds, tides, and currents ; but as this would cost half-a-million sterling, nothing could be done in the matter without the sanction and assistance of the French authorities. About the same time Mr. Grantham, utilizing the existing harbours, pointed out how they might be rendered available for steamers much larger than those now used, provided the vessels were of shallow draught. His scheme comprised the building of a steel steamer with a cellular hull, 400 feet long, 45 feet wide, and drawing only 5½ feet of water ; a rudder at each end, and steering apparatus on the paddle-box bridge or platform ; the bottom to be cellular, both for lightness and for strength. Railway luggage-vans would be lifted bodily on board by means of cranes. With engines of nominal 600 horse-power, he expected to attain a speed of 18 knots an hour. Experienced captains and pilots, however, expressed a doubt whether so large a vessel, even with so light a draught, could conveniently enter the existing harbours. A more extensive scheme was put forth in 1873 by Mr. Page, the civil engineer, which was certainly peculiar in its character. Experience in bridge-building and pile-driving had led him to a conclusion that an effective and economical harbour in deep water could be constructed of open piling, to break the force of the waves without checking the flow of the current ; such a harbour would not silt up with mud and shingle. He proposed a star-like structure of landing-piers and breakwater, all on piles, with two or more arms radiating from the centre ; the arms would form landing-

stages, any one of which might be chosen according to the state of the wind and tide. A line of railway would extend from the landing-stages on a viaduct to the shore, where it would be connected with the land railways. Considering that, between Ostend and Cherbourg, there is no good opening for a deep-sea harbour of masonry save at a heavy cost, Mr. Page recommended the adoption of his star-like pile harbours, sufficiently far from shore to be in deep water.

Other plans for realizing the same object, of which we will merely notice one, have been brought forward in considerable number by French engineers. In 1874 M. Reameau proposed a new harbour two or three miles out from the French coast, to be formed of concrete blocks thrown down into the sea and dressed by divers, with a lighthouse on the top, and a caisson-shaft down to below the sea bed. A railway tunnel would extend from the bottom of the shaft to the shore. An hydraulic lift at the harbour would raise the passengers and luggage to a quay alongside of which the steamers would draw up. The débris from the tunnel, and from the shaft leading down to it, would help to form a narrow belt of dry ground at the sides of the harbour.

The Twin-Ship "Castalia."—Without concerning themselves with costly harbour-works, many inventors have directed their attention to improved steamers. We have noticed one such steamer by Mr. Grantham; and another has been suggested by Mr. Mackie, C.E. He proposed a large steamer, a kind of tubular girder, light, roomy, and safe; the bottom nearly flat, and made double. The structure would be very strong, with longitudinal and transverse girders and bulkheads. Of the various compartments thus formed, those near the centre of the ship would contain the boilers, engines, stores, cargo, and crews' berths. Outside these would be two channels open at both ends to the water, a paddle-wheel working in each channel; and outside the channels would be watertight compartments to contain luggage-vans, lowered by cranes. The passengers' saloon, forming an internal part of the skeleton of the ship, would stretch over the several compartments, with a promenade deck to cover it. How far such a steamer, 300 feet long by 60 wide, would keep clear of perpetual troubles in the existing harbours, Mr. Mackie has not had an opportunity of showing.

Captain Dicey, on the other hand, has really brought into use a vessel of a remarkable kind, a double-hulled or twin steamer. He had observed that an outrigger, formed of a heavy log of timber, used on many parts of the Pacific coast by the natives, tended to prevent a boat from rolling; and he conceived that a double hull would ensure a similar result. Twin ships had already been tried on a limited scale, especially one appropriately called the *Gemini;* but they were found to be slow, because two hulls had to be forced through the water. Captain Dicey therefore planned his vessel more nearly to resemble one ship split longitudinally into two, with a vertical wall to form the inner

side of each half. Capital having been subscribed by an "English Channel Steamship Company," the builders set to work, and in 1875 the first vessel was ready. It is 290 feet long, 60 feet wide (over both hulls), and 6 feet draught. Longitudinal and transverse bulkheads in each hull, girders to connect one hull with the other, and a deck over all, virtually make the whole structure one ship. The hulls have rudders at both ends, so as to steer either end foremost. All the passenger accommodation is at and above the level of the main deck; the luggage, light goods, engines, boilers, coal bunkers, stores, and crews' cabins being below. The arrangement admits of a paddle-wheel of great diameter between the hulls. The vessel draws up more conveniently to the side of a quay or pier than one that has outside paddle-boxes. Under the name of the *Castalia*, this twin-ship has made many voyages to and fro between Dover and Calais in 1875 and 1876; and by the unanimous testimony of all passengers who have made the trip, the rolling and the consequent sea-sickness are much less, and the general accommodation much more, than in any other steamers hitherto tried. The speed, however, is less than that of the boats belonging to the South Eastern Railway Company; and this may be one reason why the two Companies have not hitherto worked in harmony. Alarmists have asked, "Is not the vessel likely to split into two, by any untoward collision ahead?" The builders (the Thames Shipbuilding Company) say that the girder-connexions between the two hulls are too strong to permit this.

The Bessemer Saloon Steamer, a vessel much more talked about than "Captain Dicey's *Castalia*," has had an unfortunate history, through circumstances known but imperfectly to the public. The principle is still more novel than that of the twin-ship. In 1870, Mr. Bessemer, the inventor of the world-famed Bessemer process for making steel, and an engineer of great ability, communicated to the "Times" a plan for a steamer that would keep channel passengers free from the tribulations of sea-sickness. He conceived the idea of a passenger saloon, in the middle of a steamer, that would so accommodate itself to the motion of the vessel as to keep its floor always horizontal; if this could be done, passengers would not be tossed about in sea-sick fashion. To test the matter, he spent £6,000 on a model vessel, constructed by Messrs. Maudslay & Field. The saloon was a kind of rotunda balanced on a horizontal axis, with the centre of gravity directly under the axis. According to dynamical principles, the floor of such a saloon would remain always nearly horizontal, whether the ship rolled or not, because the centre of gravity would naturally tend to keep vertically under the axis. Satisfied with the working of his model, Mr. Bessemer organized a "Bessemer Saloon Steamboat Company;" capital was subscribed, and the building of the ship was entrusted to Earle's Shipbuilding Company at Hull, as was likewise the construction of the engines. Mr. Reed acted as naval architect or constructor; while Mr. Bessemer himself was consulting engineer in all that

related to machinery. Although the Company was formed before the close of 1872, the ship did not make its first trip till the spring of 1875—so many were the changes of plan introduced, and so varied the unexpected difficulties.

The *Bessemer*, like the *Castalia*, was double-ended, that is, each end had a rudder, so that the ship could sail or steam in either direction without turning. There were four paddle-wheels of 28 feet diameter, two on each side; a large saloon in the middle, oscillating on an axis parallel to the keel; a hydraulic apparatus, to be tended by one man, made the saloon incline just as much in one direction as the rolling of the ship tended in the other, so as to keep the floor of the saloon horizontal athwart the vessel. The saloon did not swing head and stern, and therefore was not protected against the inconvenience of pitching. The dimensions of the vessel were great:—350 feet long, 40 wide, and 60 over the paddle-boxes, but only 7½ feet draught of water. The four paddle-wheels, and the very high engine-power, supplied by two pairs of large engines, were intended to ensure a speed of twenty miles an hour; completing a trip from Dover to Calais in a little more than this time. The saloon was not circular; it was 60 feet long, 30 wide, and 20 high; the position was where the pitch and roll of the ship were at a minimum; and (as we have said) machinery was provided for counteracting such rolling as was experienced. The machinery did not, in effect, give motion to the saloon; it rather prevented it from acquiring motion that would have tilted up the floor and the passengers. The cabin and deck accommodation was of a very complete kind; while baggage, mails, light merchandize, and bullion, were put into water-tight crates, and lowered into receiving rooms below deck.

This novel, capacious, and costly steamer has had a luckless history. After numerous alterations and modifications, it was launched in September 1874, but did not make its first trip across the Channel till the following May. The peculiarity of its appearance earned for it a jocular comparison with "a cross between a canoe and the *Devastation*," and "a barge lying low under a towering load of hay." Accomplishing a trip across in about an hour and a half, the ship ran against the pier at Calais and wrought much damage. From that time arose a series of difficulties, some mechanical and some financial, which need not be noticed here; suffice it to say that the *Bessemer* is not now doing anything to solve the Channel problem.

Train Ferries or Floating Railways.—The idea on which Mr. Bessemer had worked, in planning the vessel just described, was "how best to improve the present means of transit across the Channel; to leave undisturbed the vast interests that have grown up in and around the several ports through which the present traffic flows; to utilize our present railway system; and, with the least expenditure of money and of time, to provide a means of ocean transit that shall be free from the miseries inherent in the present system of steam navigation." Although Mr. Bessemer, through adverse circumstances, has not achieved this result, the

idea is a good one, and has been entertained by many other busy brains—as the foregoing pages show. Other projectors have asked "Could we place a laden railway train on a steamer, steer it across the Channel, and land it on the French side?" Something of this kind is done in regard to carts and waggons on the Steam Ferries at Plymouth, Portsmouth, and elsewhere; and it is also planned by the Thames Steam Ferry Company. It is also adopted for railway trains across one or two estuaries in the North, under exceptional circumstances; and the Americans have to some extent followed the same course over portions of the Canadian lakes.

To show how this train-ferry plan is practically worked, we may usefully notice what Mr. Scott Russell has effected in Switzerland. Lake Constance, until 1869, interrupted the continuity of the railway system in that part of Europe, preventing the passage of through trains from the Bavarian and Wurtemberg lines to those of Switzerland and the Tyrol. The English engineer was invited to provide a remedy; and he did it very effectually. He had already built the first fast steamer that the Lake had been provided with; and now he contrived another, of improved construction, that would act as a floating railway, without any need for transhipment of passengers and luggage from rail to boat and then from boat to rail. The German railways reach the northern shore of the Lake at Friedrichshafen; the Swiss railways reach the southern shore at Romanshorn, nearly opposite; and Mr. Scott Russell made these two points the termini of his new ferry. As the two small harbours are shallow, and will not accommodate vessels drawing more than six feet of water, he laid his plans accordingly. He built a steamer, the deck of which would furnish standing room for two rows of railway carriages, seven or eight in each; it was 240 feet long, and conveniently provided with platforms, offices, refreshment-rooms, and other steam-boat adjuncts. The upper deck was appropriated to these purposes; the main deck to the reception of railway carriages, on rails laid down for the purpose. Double iron sides connected the upper deck with the lower, making the body of the ship a sort of hollow iron girder, 25 feet deep in the centre, and very strong. The upper deck was uncovered at the two ends, thereby allowing passengers to promenade or sit in the open air during the brief voyage. Each end of the vessel had a rudder, to enable it to steer either end foremost. The two paddle-wheels worked independently, each with its own engine, to lessen the inconveniences of a possible failure of machinery. With the helm turned fifteen degrees over, the vessel could steam across the lake in one hour even with only one paddle-wheel; and great additional steerage-power was obtainable by working one wheel faster than the other, or one forward and the other backward. The railway working is thus managed. When a German train arrives at Friedrichshafen, on the northern shore of the lake, a locomotive in the rear pushes it upon a kind of bridge, which is suspended at one end by means of balance weight; the free end

descends to the level of the steamer moored below, by a gradient which is made to vary with the height of the water. The laden train is thus set afloat, after a delay little exceeding five minutes; the steamer makes its voyage across; by a reverse series of operations the train is raised again to *terra firma*, and the passengers at once make acquaintance with Swiss railways.

Long before Mr. Scott Russell had provided Lake Constance with the floating railway just described, other engineers had been pondering on some such plan for crossing the English Channel. M. Chinié, one among these, drew out a scheme for two towers, in the sea, and at some short distance out from the English and French coasts respectively. An embankment or viaduct would extend from each tower to the land railways of the adjacent coast. A train (say on the way from London to Paris) would run along the embankment or viaduct to the tower outside Dover; a platform, worked by hydraulic power, would receive the train, and then sink nearly to the sea-level, where a raft-ship or ship-raft would receive the train. After a voyage across the Channel, a reverse series of operations at Calais, or some place near it, would land the trains on the French lines of rail, ready to pursue the journey to Paris. Mr. Daft, another engineer who has directed his attention to this part of the subject, has proposed the adoption of a capacious raft, having the comfort and elegance of a steamship. His plan comprises the construction of two long quadrangular hulks, placed parallel at a few yards apart, strongly fastened together by girder-bridges, and decked over. Broad paddle-wheels, one behind another, would work in the space between the hulks. Lines of railway, laid down on deck, would afford facilities for the reception of trains, with or without passengers; while a sloping gangway rail would connect these deck lines with the land lines of the Railway Companies. Each shore would require a basin for the accommodation of so large a floating mass. The dimensions would be so great that the paddle-wheels, ranged one behind another, would be four in number, with four steam-engines to work them, one to each. The theory seems to be, that with a vessel so constructed, an enormous freight in passengers and merchandize could be carried, the passage made in an hour, and a steadiness of flotation ensured that would reduce the discomforts of sea-sickness to a minimum. We are not aware that Mr. Daft has gone beyond a patent for his plan.

If all the projects of an analogous kind were noticed, the details would carry this article beyond its prescribed limits. Mr. Bridges Adams, for instance, has broached the idea of two monster rafts, side by side, one for a passenger train and one for a goods train, with a paddle-wheel or a double-screw between them. Mr. Galloway has proposed something similar, but on a smaller scale. An idea by M. Dupuy de Lôme, a French naval constructor of much celebrity, is for a kind of flat train-raft, to run to and fro many times a day. One scheme, however, calls for more detailed notice.

Mr. Fowler's Channel Ferry Scheme.—This carefully elaborated

project has been brought forward by Mr. Fowler, engineer of the Metropolitan Railway. Working in part single-handed, in part with Mr. Abernethy and Mr. Wilson, he came to a conclusion in favour of the construction of well sheltered harbours on both coasts, capable of affording ingress and egress at all states of the tide and wind to a class of vessels in the nature of ferry steamers, of greater size and power than those which now cross the Channel, and affected by a minimum of pitching and rolling; with easy appliances for the interchange of passenger and goods' traffic between the land railways and the steamers—the same object, in fact, as that which it is proposed to attain by schemes already described, but more fully worked out in plan. According to this idea, there would be a new harbour at Dover, westward of the existing Admiralty pier, with a graving dock, a covered berth for steamers, and hydraulic lifting and lowering apparatus. Considering both Calais and Boulogne to be unsuitable for his purpose, Mr. Fowler proposes to construct a new harbour on the French coast, between Cape Grisnez and Ambleteuse, at a point the very nearest to England, and having deep water close in shore, with the Cape Grisnez lighthouse forming an excellent guide or beacon. A railway of four miles would connect the new harbour with the main French line, the "Chemin de fer du Nord," while side branches would lead to Calais and Boulogne. On the English side, short lines of rail would establish connexion between the harbour and the railways of the South Eastern and the Chatham and Dover Companies. No part of the existing harbour or piers would be interfered with; on the contrary, some part of the west side of the Admiralty pier would be made more sheltered and convenient. The depth of water is already good at the site selected, and would not require much increase. Into these two harbours would steam, according to the plan, the largest ship in the world except the *Great Eastern*—Mr. Fowler gives the enormous dimensions of 450 feet length, 57 feet beam, and 85 feet across the paddle-boxes; engines of 1,500 horse-power. Hydraulic apparatus would lower a complete train from the level of the English railways to that of the ship, at all states of the tide except the highest; at high water the level of the ship would be that of the railway quay. The end of the ship (both ends alike) would open in a peculiar way, to admit the train end-on, and would then close again. The voyage, with a ship of such size and power of engines, is estimated to be but of an hour's duration, with a very small disturbance by pitching and rolling. The train would be on rails laid along the main deck; the upper or saloon deck would have a complete provision of state cabins, ladies' cabins, private cabins, second and third class cabins, refreshment saloons, reading room, &c. Passengers could either keep their seats in the train, or enjoy the cabin accommodation on the upper deck. The train would convey luggage, mails, and light goods as well as passengers; the question as to heavy merchandize, in a train on rails laid along a lower deck, would be for after consideration. There would be

a saving of two miles by water and fourteen by land; while it is estimated that the saving of time would amount to two hours, due in part to the quicker voyage, and in part to an avoidance of the present troublesome double shifting of passengers and luggage from rail to boat, and from boat to rail. Of course, such a complete scheme would be costly; the projector estimates that £2,000,000, and a period of three years, would be absorbed in effecting it, two ships being employed; but he believes that it would so nearly pay its own expenses as to need but a small subsidy from the two Governments.

Mr. Fowler, as a civil engineer, had previouly been consulted concerning tunnel-schemes and bridge-schemes for the Channel passage. He gave up the former, because he could rely on no estimate of the money and time necessary; and the latter, because he believed the bridge and the navigation would alike be subject to perpetual dangers. Mr. Scott Russell, whose previous undertaking at Lake Constance leads him to take a favourable view of Mr. Fowler's plan, has remarked concerning it: "The comfort of taking your bed-carriage in London, and not having to leave it till you awake in Paris, need not be insisted on; and the economy and expedition which must arise from sending goods right through to their destination, without change of carriage or waggon, is thoroughly appreciated by all merchants and shippers. That the trade of Europe with England would enormously increase, who can doubt; while the mails for India would reach Brindisi or Marseilles in the same carriage in which they would be stowed by the Post Office officials of St. Martin's-le-Grand." Captain Tyler, in the report to the Board of Trade, mentioned in a former paragraph, expressed an opinion that if any sum amounting (say) to two millions sterling is spent on improving the Channel passage, Mr. Fowler's plan is well worthy of consideration. Captain Ommaney, a good authority on such subjects, has thrown out a caution respecting the requirements of new Channel harbours to accommodate such a large ship as Mr. Fowler contemplates; there must, he says, be good harbour depth for a draught of 13 feet in a steamer of 400 feet long, 10 feet in one of 350, and 7 feet in one of 300 feet.

Schemes for High Level and Low Level Bridges.—The course of our subject now leads us to notice the projects which have from time to time been brought forward for linking England to the Continent, by means of a bridge of unparalleled magnitude. But these projects need not be dwelt upon at any great length. M. Thomé de Gamond, whose name we shall have occasion to mention in connexion with tunnel schemes, at first directed his attention to the possibility of a bridge. He sketched a plan for a railway tube, about twenty-two miles long, supported, at a sufficient height above the water, on four hundred stone piers; but the estimate of cost soon put an end to this idea. He then thought of a low-level causeway, with swing or drawbridge openings to permit the passage of shipping; this in turn was abandoned in favour of another class of

schemes. About ten years ago, an English engineer turned his attention to the useful qualities of wire-rope. He conceived the idea of a row of pontoons of great height, and kept floating in position by heavy mooring chains; wire-rope cables stretched from one pontoon to another, with openings or headway under them sufficient for the passage of the tallest-masted ship; and lines of rail supported in some way by the cables. This *bizarre* scheme does not appear to have attracted much attention. Soon after this, a few French subscribers constructed a portion of experimental bridge on shore, to test the merits of a plan proposed by M. Boutet. The engineer contended that half-mile spans are attainable by his mode of construction; and in a memorial to the Board of Trade, he urged that such a bridge across the Channel, from Dover to Blancnez, would be less costly than a bridge constructed in any other way; it could be finished in a shorter space of time, and would be free from the evils of bad ventilation and the possibility of inundation. The Board of Trade made no response, neither did English capitalists; and so the scheme fell to the ground. The most wild and daring plan was one which an English projector addressed to the same Board, and elaborated in a printed pamphlet. He proposed a marine viaduct from Dover to Cape Grisnez, consisting of iron girders supported on towers or piers 500 feet from foundation to summit and 500 feet apart, at a cost of £30,000,000!

We may sum up this part of the subject by saying that the various bridge schemes are received with very little public favour. If the bridge were at a high level, with headway enough for the passage of lofty ships, the supporting piers would cost an enormous amount of time, money, circumspection, and skill to construct; while if it were at a low level, the determination of the number of gaps for the passage of ships, the mode of opening and shutting them by pivot-bridges or telescope-bridges, and the necessity for averting the danger of vessels dashing up against the bridge in rough weather, would be matters of great difficulty.

Mid-water Schemes.—While some ingenious men are planning how to cross the Channel in comfort *on* the water, and others by means of bridges *over* the water, a third group have discussed the possibility of doing so *in* the water. A railway in a tube kept buoyant at some depth below the surface of the sea would seem to most of us a wild extravagance; yet the idea has been broached by Mr. J. F. Smith. He proposes a wrought-iron water-tight tube, of such thickness in relation to its diameter, that it would just float in sea-water. To prevent it from swimming about hither and thither, certain precautions would be taken. Masonry piers, built in the sea at regular distances apart, would confine the tube on each side, thereby checking oscillation; cross-rods or beams from pier to pier, passing under the tube, would prevent it from sinking; while similar cross-rods over the tube, aided by mooring chains and anchors, would counteract any tendency to rise. To construct the tube itself would in no way be out of the

range of ordinary engineering; it would be built up in lengths of a hundred feet each, which would be floated out upon the sea, and joined end to end. How to manage the under-water part of these operations is the hydraulic engineer's business. The tube would be large enough to contain two parallel lines of railway, an up and a down line. Some kind of corkscrew staircase would be sunk on each shore down to the level of the tube, and connexions made whereby passengers may descend to and ascend from the trains in the tube. Considering that one single leak in one single section of the tube would give a watery grave to the train and all its contents, few travellers would view such a scheme with much favour. As to injury given to, or received from ships passing to and fro above, the inventor proposes to avert this by keeping the tube at a permanent level of thirty or forty feet below the surface of the water.

Schemes for a Sea-bed Tube.—There is no cause for marvel that the scheme just noticed should have had few admirers besides its projector. Most persons are of opinion that, if a railway tube were immersed in the sea in any form, it should rest on the sea bottom, so as to be shielded from the possibility of sinking lower. French engineers took up this class of ideas sooner than English. Many years ago MM. Franchot & Tessié de Mottray published a rough description of a plan for a cast-iron tube or tunnel, to be laid along the sea-bed; it would follow the undulations of the bed, and would therefore depend on the excellence of the joints for possessing water-tight qualities; but the mode of connecting the tube with the shore was not fully set forth. Next came the scheme of M. Payerne, who proposed to employ a diving-bell in laying down a smooth and regular concrete causeway on the sea-bed, and building a brick or masonry tunnel on it—a possibility, of course, but involving an unprecedented amount of submarine engineering. M. Alexandre Vacherot framed the outline of a scheme which he submitted to the late Emperor of the French in 1856, and afterwards to the English Board of Trade. According to his plan, the tunnel itself was to be formed of concrete; it was to be built on shore in sections, carried out to sea, sunk in a straight line, and the sections joined end to end; it would, when completed, form a continuous tunnel of artificial stone, or what he called a "monolith." M. Vacherot claimed for his concrete tunnel greater economy and greater safety than could be claimed for one of iron. English engineers entered the list of projectors, and suggested many variations of the one idea of a tunnel or tube laid upon the sea-bed. Some plans suggested were for a tube large enough only for road vehicles, but most of them contemplated the accommodation of railway trains. Mr. Winton gave a preference to a tube of wrought iron; Mr. Cowan to an iron tube lined with concrete; while Mr. Zerah Colburn proposed to construct an iron tube on shore, in sections one thousand feet long each, to tow out the sections one by one, sink them, and join them end to end at the bottom of the sea.

Mr. Page has proposed a scheme to this end which presents some remarkable features. He would construct on shore eight double conical iron shafts, tow them out to spots two or three miles apart, sink them, and fill in with concrete the space between the inner and outer skins of each cone. As the height of each cone would more than equal the depth of water, the cones for the middle portion of the Channel would necessarily be of vast dimensions. At the top of each conical shaft would be a lighthouse; while at the bottom would branch out openings right and left. An iron tube would be constructed on shore, in quarter-mile sections; these, when towed out and sunk at the proper spots, would be joined end to end, by workmen who would descend the cones, and work laterally under the shelter of diving bells. Mr. Page, knowing that the pressure of the water at such a depth would be immense, suggested what appears to him a feasible mode of supplying additional air to the diving bell. Supposing this remarkable idea to be well founded in other ways, the open cones would certainly be useful afterwards as ventilators for the tunnel-tube. Mr. Bateman, who has had much experience as an engineer of waterworks and other hydraulic constructions, has suggested a plan for a sea-bed tube 13 feet in diameter and 4 inches thick; he would build it up on shore in sections; the sections, when towed out and sunk, would be joined end to end by men working in a kind of chamber on the sea-bed. This chamber, like the celebrated shield with which Sir M. I. Brunel constructed the Thames Tunnel, would be pushed on horizontally as fast as the tube was finished. Another engineer, finding that the several sections would be very short, and that the tube would therefore require an enormous number of rivets, points to the extreme likelihood of the tube being exposed to leakage and consequent interruption.

Early Schemes for a Tunnel.—Be it for better or for worse, the governments, the civil engineers, and the commercial men of England and France are just now paying more attention to an under-sea tunnel than to any other mode of crossing the Channel. The doubts, dangers, and difficulties have not been strong enough to shake the faith of those who believe in a tunnel; but even this faith does not point to a real finishing of the work until the nineteenth century has nearly come to its termination. Tunnel schemes were started long before the days of railways. When Mr. Fox went to Paris in 1802, he conversed with Napoleon (at that time Consul Bonaparte) about a plan which had been suggested by M. Mathieu. The details are now imperfectly known; but the idea was that of a horizontal tunnel wide enough for vehicles and foot passengers; descending passages from the two shores would join the two ends of the tunnel, at such a depth below the sea-bed as to avert the irruption of water. The tunnel would be paved, lighted with oil lamps, and ventilated by means of iron shafts running up through the sea to the open air. Bonaparte expressed a belief that the two countries ought to execute such a grand work as this in common; but war soon

broke out again, and the peaceful project fell to the ground. Other schemes for a tunnel suitable for vehicles and foot passengers, but not for railway trains, have too near a family likeness to need separate description.

Tunnel Schemes of MM. Favre and Thomé de Gamond.—One of the earliest propositions for a continuous railway from England to France, running through a submarine tunnel, was brought forward by M. Favre. A railway tunnel in the south of France, three miles long, had suggested to him the possible means of constructing one seven or eight times that length. He made soundings along four lines of passage across the Channel—from Cape Grisnez to Dover and to the South Foreland, and from Cape Blancnez to the same places. Along those four routes he found soundings varying from 9 to 55 mètres, or 30 to 180 feet; the straight-line distance was about 30 kilomètres or 20 English miles—the width of water, independent of the inclined land tunnels to give access to the sub-sea tunnel. He would make the latter at least 35 mètres, or 116 feet, below the level of the sea-bed, so as to be secure from the irruption of water. Whether he made himself acquainted with the geological stratification of the subsoil is doubtful; but he expressed great confidence that infiltration would not occur, and that, in regard to the scheme generally, "a submarine railway would be safer than an ordinary open-air railway, in being free from atmospheric variations, snow, ice, and destructive agencies of various kinds." He proposed to prepare for the excavation by sinking shafts through the sea and its bed, at about a mile and a half apart. At the bottom of each shaft the tunnellers would work right and left, so as to have only three quarters of a mile absence from (something like) daylight. The rubbish or spoil brought up from the tunnel would form useful little islets around the shafts. M. Favre flattered himself that he could complete the whole undertaking for 80,000,000 francs (£3,200,000). At the time he proposed his plan, the atmospheric system of train-traction was in action on a few of the English railways; and he proposed a similar system instead of locomotives for working in his tunnel. His estimate of income was as sanguine as that of outlay was modest. He counted upon carrying sufficient passengers and luggage to bring in 4,000,000 francs a-year, coals 10,000,000, and general merchandize 6,000,000; out of this total of 20,000,000 francs (£800,000), he estimated that 40 per cent. would suffice for working expenses, leaving enough clear profit to yield 15 per cent. per annum on the capital. An excellent return—on paper!

Another French engineer, M. Thomé de Gamond, about twenty years ago brought forward a scheme which we must notice somewhat more fully, because it forms the basis of one which is at present engaging the attention of the French and English Governments. He pointed out three obstructions which stood in the way of rapid communication between England and the East, viz., the English Channel, the Alps, and the Isthmus of

Suez. Since he wrote, two out of these three obstructions have been practically removed, by the magnificent railway tunnel through or under Mont Cenis, and by the still more magnificent (and costly) ship canal across the Isthmus of Suez; and M. Thomé de Gamond expressed a hope that he himself might possibly have the honour of minimizing the remaining obstacle, by forming a railway tunnel from England to France; thus permitting a continuous railway run for a train from the north of Scotland to the south of Italy. He first thought (as we have stated) of carrying his railway on a high-level bridge, supported on four hundred stone piers, or on a low-level causeway, having drawbridge openings for the passage of ships; but he abandoned both these modes of proceeding—as most engineers have done, after counting the inevitable cost and the numberless difficulties. He resolved on a tunnel, which he described in a quarto volume of two hundred pages, illustrated by large coloured plans and sections, and elaborated in all the chief particulars. After examining six routes across the Channel, starting at various points between Folkestone and Dungeness on the one coast, and ending somewhere between Calais and Boulogne on the other, he gave the preference to one from Cape Grisnez to East Wear Bay, the latter being about midway between Dover and Folkestone.

And now for the scheme itself. Out in the middle of the strait, in the direct line chosen, is a shoal called the *Varne*, which has on it 20 feet depth of water at low tide. On this he proposed to construct a vast work to be called *l'étoile de Varne*, or the *Varne Star*. This would comprise a shaft 300 feet deep, descending through the water over the Varne, then through the Varne itself, and then through the chalk strata underlying the sand of the Varne, until it reached the level where the railway would be constructed. This shaft would be enormous beyond anything yet soberly recommended by engineers—1,200 feet across in the longer axis of an oval section, and 600 feet in the shorter axis. Around the interior of this a spiral roadway would run, fitted to receive railway vehicles. Around the top of the huge shaft would be constructed four granite quays, pointing out like the rays of a star, a small basin for the reception of shipping, and a lighthouse. We should mention that the width of shaft indicated is that which would be necessary for the spiral descent and ascent of carriages and waggons; much smaller dimensions would suffice for a spiral footpath, a spiral staircase, or any kind of power hoist, steam or hydraulic. At the bottom of the shaft would be a regular railway station, with passenger platforms, &c.! To facilitate the excavation of the tunnel, not only would the Varne shaft be brought into requisition, but thirteen minor shafts also, formed at different points along the line of route. Not mere shafts, these; they would be cones of masonry, some immersed in 180 feet depth of water, and very broad at the bottom, to obtain a firm support on the sea-bed; the vertical shafts would be sunk at the bottom of the cones, down to the proposed level of the tunnel. The Varne shaft, the thirteen minor shafts, and the

two shore ends would form sixteen working points for the excavators, bricklayers, masons, &c., employed in constructing the tunnel. The summits of the shafts would be 30 feet above the surface of the water ; and each shaft would thus be permanently available for ventilating the tunnel. At the two shores, dry-land shafts would descend from the open air to the tunnel level, with a railway station at the bottom, and a spiral stair for the ascent and descent of passengers. An inclined tunnel of 3½ miles would bring up the trains to daylight on the English side, while one of 5½ miles would be necessary on the French side. At the grand central Varne station, ships would exchange passengers and luggage with the tunnel, through the medium of the monster shaft. How any engineer could imagine that such a work, even if possible of execution (some of the conical shafts near the centre of the line of route would be 700 feet diameter at the bottom on the sea-bed, 140 feet diameter at the top, and 180 feet high !), could be completed for £6,500,000, it is not easy to say.

Minor Tunnel Schemes.—In what sense M. Thomé de Gamond's extraordinary idea can be said to have suggested the plan at present engaging public attention, we shall explain presently ; but it may be well first to advert briefly to several minor schemes.

(1). Mr. Nicol's plan is for a tunnel a little higher in the middle than at the two ends, in order to facilitate drainage by pumping up water from the lowest points, at or near the two shores ; he proposed at first to line his tunnel with masonry, but saw reason afterwards for suggesting iron instead. (2). Mr. Austin's plan comprises three distinct tunnels, side by side, with three drainage-culverts under them, at a depth of 60 or 70 feet below the sea-bed ; the tunnels would afford room for six lines of rail, up and down, for express, ordinary, and merchandize trains ; the chalk from the excavation and the shingle from the beach could be made into blocks of artificial stone for lining the tunnels. Mr. Austin estimated seven years of time and £6,000,000 of capital for the fulfilment of this scheme ; but he submitted a modified programme to the Emperor of the French in 1863. (3). Mr. Remington, in 1865, planned a tunnel from Dungeness to Cape Grisnez ; he distrusted the chalk stratum, placing more reliance on the Wealden formation ; and his plans and sections, deposited with the Board of Trade, showed at what depth and in what manner he proposed to work. (4). Sir John (at that time Mr.) Hawkshaw, caused borings to be made in 1866, near both shores, and soundings along the proposed line between the two countries ; he pronounced in favour of a tunnel through the chalk, but did not pin himself down to an estimate of the time and money required. (5). Mr. Hawkins Simpson, in 1869, submitted to the Board of Trade a project for a Channel tunnel to be worked by atmospheric pressure, on what he called the *Æolian* system ; he urged that the ventilation of the tunnel would be better effected, and the traffic more cheaply and expeditiously conducted, than

on the locomotive system. (6). In 1871 Mr. Remington, in a letter to the "Times" re-stated the reasons which had long before led him to disapprove of tunnelling through the sub-sea chalk. The recent finishing of the Mont Cenis Tunnel seems to him to be a favourable augury for a Channel tunnel; but he advised caution in selecting the geological stratum to be pierced. At a depth of 100 feet below the sea-bed he believed there was a thick stratum of clay, free from and impervious to water. He found that, in mid-channel, the chalk of the sea-bed is quite bare of any plastic covering that could resist a formidable pressure of sea-water. He advocated a narrow tunnel, for a single line of rails, with bays or sidings for the passage of trains; a second tunnel, if wanted, might afterwards be made by the side of the first. The Varne, or some other shoal in mid-channel, might be selected as the site for a ventilating shaft. The spoil from the tunnel might be utilized to reclaim much of Romney Marsh, behind Dungeness. (7). M. Lesseps, the celebrated engineer of the Suez Canal, announced in 1875 his belief in the soundness of the chalk stratum for the Channel tunnel. He would go 160 feet below the sea-bed, and would ventilate by means of land shafts at the two ends of the tunnel. Other projects, started within the last few years by Mr. Mayer, Mr. Dunn, Mr. Sankey, Mr. Boyd, &c., may be passed here without comment, as presenting no special characteristics.

The Anglo-French Government Scheme.—We have thus cleared the ground for a consideration of that particular Channel-scheme which is at present occupying more attention than any other, partly because the Governments of the two countries are negotiating on the subject. The Paris Exhibition of 1867 was the means of drawing public attention strongly to the matter. M. Thomé de Gamond exhibited a model of the tunnel and works proposed by him; and although his stupendous cones, immersed in a vast depth of water, gave a tinge of extravagance to the whole affair, his model induced other engineers to interchange views. Sir John Hawkshaw had, two or three years earlier, pronounced in favour of a tunnel through the chalk. Geologists have shown that England was once joined to the Continent, the insular separation having been effected by irruptions of the sea; chalk is known to exist to a great depth on both coasts, and it is inferred that there is an unbroken connexion in chalk under the soil of the sea-bed. Sir John made careful geological examinations of both coasts, and then, in conjunction with Mr. Brassey and Mr. Wythes, caused borings to be sunk on each coast. There resulted a plan for a Channel tunnel, starting from St. Margaret's Bay, four miles east of Dover, and ending three miles west of Calais, between that town and Sangatte. The three engineers dispensed with shafts and all other works in the sea, proposing to excavate the tunnel from the two ends only, and afterwards to ventilate it by air-pumping apparatus. At a depth of two hundred feet below the sea-bed it was considered that infiltration of water into the chalk would be almost impossible.

After various discussions in 1868, an Anglo-French Committee took up the subject in 1869, and prepared a scheme for submission to the Board of Trade. The Emperor Napoleon III at the same time appointed a French Commission to investigate and report; the Commissioners pronounced in favour of a tunnel through the chalk, but could come to no decision as to the length of time or the amount of capital that would be needed. They recommended, as a preliminary measure, that the two Governments should cause two driftways to be made under the sea-bed as a means of ascertaining practically the nature of the stratification. The disastrous Franco-German war in 1870–71 put a sudden stop to these Channel discussions, and France was too overladen with financial obligations to enable her to do much in the matter in 1872. At length, in 1873, negotiations assumed a new aspect. A few projectors formed a "Channel Tunnel Company," and two Committees were appointed to organize a scheme. Lord Richard Grosvenor, Mr. William Hawes, Admiral Elliot, Mr. Brassey, Sir John Hawkshaw, and Mr. Brunlees on the one side; M. Michel Chevallier, M. Talabot, M. Thomé de Gamond, &c., on the other. The politicians and commercial men discussed the terms of possible agreements with the two Governments; while the engineers resolved to commence a shaft and a short driftway on each shore as an experimental precaution. The various Chambers of Commerce in France, in towns anywhere near the French end of the tunnel, were consulted, as were the Prefects and Councils of the Departments, and the authorities of Calais and Boulogne; the Railway Companies, too, of northern France and of south-eastern England were taken into council, and the English Government were invited by the French Government to participate in the great work. Baron Rothschild, M. Léon Say, and M. Michel Chevallier formed a syndicate to discuss matters of finance, subsidy, concession, &c., and to find the means for defraying the cost of preliminary borings, driftways, &c.; M. Lavalley was joined with them as engineering adviser. Thus passed 1873 and 1874.

In 1875 the Syndicate of Concessionaires agreed with the Prefect of the Pas de Calais concerning the tariff of charges for passing through the tunnel, if and when completed; it was resolved to be about fivefold the average charge of French railways per mile. A Bill was brought into the Chamber of Deputies to give legislative sanction to the scheme, and this became law after passing through its various stages. The English and French Governments appointed a joint Commission to examine and report on the international features of the whole scheme. The English members were Captain Tyler, of the Board of Trade, Mr. Kennedy and Mr. Austin Lee, of the Foreign Office, and Mr. Horace Walton, of the Department of Woods and Forests; the French members were M. Gavard, M. Kleitz, M. Lapparent, and M. de Lafaulotte.

The report of these joint Commissioners, published in the summer of 1876, is so surrounded with conditions, provisoes, and

precautions against possible contingencies, that the net result is calculated somewhat to damp the enthusiasm of those who imagined that a grand international work is to be commenced forthwith, and pushed on to a successful conclusion by the joint forces of the two nations. The Commissioners, after holding many meetings at Paris and in London, agreed on a series of resolutions to be presented to the two Governments, and to form the basis of a Treaty to be hereafter negotiated, which Treaty itself will require to be ratified by the respective legislatures—a long double process which will go far to exhaust the year 1877. The following are the chief headings of the recommendations stated as concisely as possible. The boundary between the two countries (in regard to this tunnel) shall be midway between low water on the English side and low water on the French side. Each country is to construct its own half of the tunnel, in conformity with English and French decrees, orders, and statutes respectively. The tunnel, with its rails, is to be placed in connection with the existing English and French railways. By or before the month of August, 1880, *the* French Company and *an* English Company are to negotiate and sign an agreement concerning the construction, maintenance, and working of the tunnel and its accessories. An International Commission of six persons shall be appointed to be the medium of communication between the two Governments and the two Companies respectively. These Commissioners are to be permanent inspectors, advisers, and arbitrators, and are to keep the two Governments well informed on all matters relating to the great undertaking ; and they will submit to the Governments any proposed Supplementary Conventions touching the construction and working of the line. A tariff of maximum fares and rates will be set forth officially. Each Company is to keep its own half of the tunnel in repair, under stringent obligations. The Governments are to grant a concession of 99 years to the Companies ; at the end of that period the rights of the Companies will cease, and the two halves of the tunnel will become national property, English and French respectively. The tunnel is, at this date, to be surrendered in good condition, and the rolling stock, plant, stores, &c., to be taken at a valuation. Preliminary works of exploration are to be commenced before July, 1877, and the Companies or Concessionaires, if not satisfied with the results of the borings, or if influenced by any other circumstances, may abandon the whole undertaking any time before August, 1880, or before August, 1883 by special agreement. If the Companies, after the trial borings, &c., decide to retain the concession and to proceed with the undertaking, they are to be allowed twenty years from that date for constructing and finishing the tunnel and works. (Thus the opening of the tunnel for traffic *may* be delayed till the year 1903). The Concession may be forfeited under circumstances provided for in the official documents, or the Companies may surrender it on showing their inability to finish the works. If the works are finished and opened for traffic, at the end of thirty

years thereafter the two Governments may purchase them in their entirety, at an annuity-price depending on the ascertained net profits, the annuity to be payable until the end of the 99 years concession. The breaking out of war between England and France, or any suspension of friendly relations that might make the tunnel-railway a source of danger to one or both, is provided for in a very sweeping way. Each Government may stop the works or the passage through its own half of the tunnel, or damage or destroy the works, or flood the tunnel with water. This it may do without consulting the wishes of the other Government; but a basis is laid down on which compensation to the Companies is to be estimated.

It will be seen, then, that the two Governments must frame and sign a treaty, and that this treaty must be ratified by the two legislatures, before the Tunnel Company can know what is to be its future position in regard to the two nations. Moreover, the Company really consists at present of only a few projectors; there is no large body of shareholders; there is no fund except a few voluntary subscriptions; and as no one knows whether the total cost will be five millions or ten millions sterling, no scheme for raising the necessary capital has yet been put in operation. The South Eastern, the Chatham and Dover, and the Northern of France Railway Companies have subscribed towards the fund for making the experimental driftways; the remainder having been contributed by various persons and public bodies. These experimental works are at the present time in progress. Should nothing occur to necessitate a change of plan, the tunnel will commence at St. Margaret's Bay, and will proceed by a descending gradient of 1 in 80 for about three miles; from thence to the centre of the Channel will be on the slight gradient of 1 in 2,640; and the ascent to the French shore will be somewhat similar. Below the rails in the tunnel will be the necessary drains, with pumping stations at the two shores; pipes for ventilation, pierced with air-holes, will run along the two sides. Loop lines will connect the mouths of the tunnel with the existing railways. A tunnelling machine, invented by Mr. Dickenson Brunton, is to be used; it is said to cut through grey chalk at the rate of a yard per hour. The machine cuts away the chalk in vertical slices, which break up, fall upon an endless band, and are conveyed out to the mouth of the tunnel. With two machines working from the two ends, the engineers believe that a driftway could be pierced in two years, and that an enlargement of this driftway would form the tunnel itself.

Mr. Prestwich, in a paper read before the Institute of Civil Engineers, discusses the geology of the Channel district, and believes that the chalk will be safe for tunnelling, but anticipates extreme difficulty in conducting the operations. To many engineers the problem of ventilating the tunnel presents more difficulties than that of constructing it. If (some of them urge) locomotives and fuel be used for working the trains, and if there are several trains per day the air must be renewed every hour

to preserve it in a sufficiently pure state; and this renewal would cause a current of twenty miles an hour towards one end or the other. No such difficulty has ever before presented itself in practical engineering. The Mont Cenis Tunnel, by far the longest in the world at present, is only one-third as long as the Channel Tunnel will be, and is, moreover, much better suited for ventilation. The Metropolitan Underground Railway, though pierced with numerous openings for stations, light, and ventilation, is nevertheless filled all day long with very impure air. Even if absolutely smokeless fuel were used, the sulphurous and other gaseous fumes would unavoidably vitiate the air of a tunnel twenty miles or more in length.

The Baron M. M. von Weber, a German engineer, has suggested reasons for doubt whether, even if constructed, the Channel Tunnel would ever pay more than a trifling interest on the heavy outlay. Supposing that 300,000 passengers cross yearly between the four ports so often named, and this number be multiplied sevenfold by the tunnel facilities, there would still be only a small margin of profit at the present rate of steamboat fares; while if that rate were much raised, the increase of number would be checked. Goods' traffic must be counted on to supplement the gross receipts. This traffic would only be such as can afford to pay a high-speed rate of freight; the heavier and bulky articles—coals, rails, iron manufactures, machinery, cotton goods, &c.—would probably still continue to go by sea to the several Continental ports. Another consideration offered by him bears relation to the trucks or waggons in which the goods are packed. If the traffic were to become at all considerable, more English waggons would be wanted to traverse the Continent than foreign waggons to traverse England; seeing that our exports of bulky and ponderous articles are so much greater than our imports, so far as concerns the Continent of Europe. Thus would be required a large increase in the working plant of the English Companies, involving a certain outlay for an uncertain profit. Then again, English railway waggons are nearly always lower and shorter than foreign, and have points of difference in their construction which would render it difficult for the two kinds to be linked together in the same train. Not two kinds merely, for the waggons of France differ from those of Belgium, Germany, and Italy, as well as from those of England. Moreover, the legislatures and governments of the Continent insist on regulations which are not in force in England; insomuch that through traffic in merchandize would encounter obstacles of which we know nothing—rendering the invaluable "Clearing House" system, which so much facilitates traffic within our own insular limits—almost inapplicable. The rolling stock accounts and the through traffic accounts would alike become complicated and unsatisfactory. The Baron sums up with the sarcastic remark that "The Tunnel project arose from fear of sea-sickness, and is therefore literally a sickly one."

G. Dodd.

THE LOAN COLLECTION OF SCIENTIFIC APPARATUS AT THE SOUTH KENSINGTON MUSEUM.

One of the recommendations of the Royal Commission on Scientific Instruction, or, as it is commonly called, from the name of the scientific nobleman who presided over it, the "Duke of Devonshire's Commission," is to the following effect:*—"We recommend the promotion of a collection of physical and mechanical instruments; and we submit for consideration whether it may not be expedient that this collection, the collection of the Patent Museum, and that of the Scientific and Educational Department of the South Kensington Museum, should be united and placed under the authority of a Minister of State."

To form at once a museum of the character and scope indicated in this recommendation would, if undertaken at once, without inquiry, and the acquirement of much information as to the nature and extent of the instruments and apparatus which are to form such a collection, be a matter of great difficulty. It would require the co-operation of many minds, both here and on the Continent, and the services of men whose time and attention are already fully occupied in educational work or the labour of research. It was, therefore, probably as a step in the direction of ascertaining the amount and character of the material available for a collection of scientific instruments and apparatus, that the Lords of the Committee of Council on Education determined to hold, in connection with the South Kensington Museum, an exhibition of such of these appliances as could be obtained on loan. Most of us can recollect, and recollect with pleasure, the loan exhibition of art manufactures which was shown at South Kensington in 1862—an exhibition of such rare excellence and so full of interest as to compete successfully with the huge international show held, one might almost say, next door to it at the same time. A collection of art objects on loan has always, since that time, formed part of the Museum itself; and it seems to suggest itself at once that the course pursued on that occasion, and the results obtained thereby, may now repeat themselves, and that there may be thus now done for science what was then accomplished for art.

With this object in view, the Lords of the Committee of Council on Education issued, early in the year 1875, a minute announcing their proposal to hold a "Loan Exhibition of English and Foreign Scientific Apparatus" during the summer months of that year; and to advise them in the matter, they requested the co-operation of the Royal and all the other scientific Societies of the metropolis. The chairman and one of the members of the council of each of these societies were asked to form themselves into a committee for this purpose, and to suggest the names of all the gentlemen who, from their position in the scientific world,

* Fourth Report of the Royal Commission on Scientific Instruction and the Advancement of Science, p 23, § ix.

should be requested to join the committee. In this way a committee was constituted, consisting of all the men of scientific reputation in the United Kingdom; and, on the 13th February, 1875, the Duke of Richmond and Lord Sandon, President and Vice-President of the Council, met the members of the committee, and laid before them the objects of the proposed Exhibition. It was on that occasion explained that the collection should be limited to "apparatus for teaching and for investigation, and also such as may possess special interest on account of the persons by whom, or the investigation in which, it has been employed." The committee decided to resolve itself into subcommittees for the different branches of science, mechanics, including pure and applied mathematics, chemistry, including metallurgy, geology, mineralogy, and geography, physics, and biology. It was also decided to obtain the co-operation of foreigners, men distinguished in science, who should form committees for their respective countries, to obtain from each a due representation of the instruments used in the different branches of scientific research and instruction. By this means would be secured one of the great objects of the Exhibition—that of giving an opportunity to the philosophers of one country of seeing and comparing the methods of scientific investigation in other countries; to the makers of philosophic apparatus this opportunity should, if possible, be of still greater interest and advantage. The invitation thus given was most energetically responded to; all the foreign Governments, at the instance of the British Ministers at the Courts of Europe and America, encouraged in every way the undertaking, and gave every facility for carrying it out. Committees were appointed in France, Belgium, Switzerland, Italy, Russia, the Netherlands, Norway, and other European countries, consisting of men whose reputation is world-wide. In Germany two committees were formed: one at Berlin, presided over by Dr. A. W. Hofmann, F.R.S., Professor of Chemistry at the University, and formerly Chemical Professor at our own School of Mines. The labours of this committee were encouraged by the great interest shown by their R.H. the Imperial Prince and Princess of Germany; to their personal endeavours the exhibition is indebted for many objects of the highest scientific interest which would otherwise scarcely have found a place there. The other German Committee represented other cities and towns of Germany, including all the universities and other centres of scientific instruction—among them the renowned universities of Bonn and Göttingen, Munich and Tübingen, the resuscitated university of Strasburg, Liebig's university of Giessen, the celebrated Mining School at Freiberg, in Saxony, and the Polytechnic Schools at Dresden, Aachen, Chemnitz, &c. Of all the countries who may fairly be described as being in the first rank of civilization, the United States of America alone has been unable to respond to the invitation to take part directly in this exhibition. Their own great exhibition, held this year in Philadelphia, occupied

fully the attention of their men of science, and, as a consequence, all the objects of interest in this collection from America are sent secondhand through their fortunate possessors in Europe.

At first, as has been already explained, the intention was to hold the exhibition in the galleries of the South Kensington Museum, but after a short time it was seen that the space there available would not be sufficient for a tithe of the objects which it was proposed to send. Even a proposition to divide the exhibition, and to admit one year the apparatus and instruments under three of the heads of the classification, and the remainder in the following year, would, if adopted, not have gone any great way in increasing the accommodation, while it would have deprived the Exhibition itself of much of its interest, and of one of the advantages which could be derived from it, that of a direct comparison of the methods and appliances used in different branches of physical science. Fortunately, the space question was most satisfactorily disposed of by the offer of the Commissioners for the Exhibition of 1851, who liberally placed at the disposal of the Science and Art Department some of the galleries erected by them in 1870 for the series of Annual International Exhibitions. By this offer the collection was able to occupy two long galleries on the west side of the Horticultural Gardens, one on the ground floor, the other on the first floor, each over 500 feet long, with some accommodation outside for special objects of larger size. Even this space, however, was ultimately found to be quite insufficient, and almost at the last moment a portion of the additional gallery on the west, and three large galleries on the south side of the Horticultural Gardens, which were built in 1862 for refreshment rooms, and were occupied in the Annual International Exhibitions above alluded to for the same purpose, were taken for the use of the exhibition. These afforded an additional space of nearly 700 feet run. Altogether, the Loan Collection occupied galleries extending over 1,680 feet in length, by a breadth varying from 18 to 35 feet; or in all more than 30,000 square feet.

When the sub-committees of the different sections commenced to discuss the proposed arrangements for the Exhibition, they soon discovered that the time before the date first fixed for the opening would be far too short for getting together a complete representative collection, not only from the United Kingdom, but from foreign and in some cases distant countries. One of the earliest recommendations, therefore, made by the general committee was, that the opening should be postponed to this year, and in accordance with this recommendation it was fixed for the 1st April, 1876. Subsequently, however, the large number of objects which arrived from abroad, and in several instances the late period of their arrival, compelled a still further postponement until Saturday, the 13th May, on which day Her Majesty personally attended a private view of the collection. Even then the instruments from Russia and Italy had only just been arranged, and those from Spain had not yet arrived.

The classification of the collection early engaged the attention of the committees, and it was ultimately determined to arrange all the objects in the following sub-sections :—1. Arithmetic ; 2. Geometry ; 3. Measurement ; 4. Kinematics, Statics, and Dynamics ; 5. Molecular Physics ; 6. Sound ; 7. Light, including Photography ; 8. Heat ; 9. Magnetism ; 10. Electricity ; 11. Astronomy ; 12. Applied Mechanics ;* 13. Chemistry ; 14. Meteorology ; 15. Geography ; 16. Geology and Mining ; 17. Mineralogy and Crystalography ; and 18. Biology. Afterwards, it was found advisable to add a 19th section, that of Educational Appliances. Of course, these sections admitted of still further sub-classification, but to indicate this at length, as it was originally laid down by the committee, would occupy too large a space here.

To add to the interest of the Exhibition, and to improve its capabilities for affording instruction, a handbook was prepared, at the request of the Lords of the Committee of Council. It consists of a series of monographs or treatises on the different sciences as above classified, and as illustrated by the objects in the exhibition itself, written by the most eminent men, distinguished for their labours and researches in the respective sciences. The introductory notice, by Prof. J. Clerk Maxwell, F.R.S., contains some considerations concerning scientific instruments, their objects and functions, with an account of the general principles of their construction. Among the other articles, those on Arithmetic and Geometry are by Prof. H. J. S. Smith, F.R.S. ; on Measurement and Kinematics, by Prof. W. K. Clifford, F.R.S. ; on Light, by Mr. W. Spottiswoode, F.R.S. ; on Heat, by Prof. P. G. Tait, F.R.S. The article on Astronomical Instruments is from the hand of Mr. J. Norman Lockyer, F.R.S., and that on Apparatus used in Biological Research, by Prof. T. H. Huxley, F.R.S. Many of these notices give an historical account of the sciences of which they specially treat, but as the whole work had to be passed through the press at an early period, so as to be ready for the opening, and when it was hardly known what contributions would be sent, much less what had actually arrived, the references to the objects in the collection which would have served to illustrate the remarks in the accounts of the various sections are not as numerous as might be wished. This, though depriving the work in question of some of its value, considered as a Handbook to the Exhibition, does not detract in any way from its character as a scientific work of the highest excellence.

The preparation of a catalogue of such a collection as this is necessarily a work of great labour, and also, as most catalogue compilers have learned to their sorrow, one which earns very small thanks. In this case, the Germans had prepared a catalogue of their own portion of the collection, which up to a very late date was still in the original language. The difficulty of translating such a compilation, with all the technical terms which

* This section, as will be subsequently seen, included Naval Architecture and Lighthouses.

it contains, can only be realised by one who has had practical experience of it. To translate with accuracy (we will not say with elegance) into English, a scientific treatise, requires the labour of an Englishman who has not only full command over his own language, and a perfect knowledge of the one from which he is translating, but has also a good acquaintance with the subject on which he is engaged. Added to the short time in which it had to be done, this may give some idea of the difficult nature of the work which was executed. It had been arranged that the catalogue should contain, besides the name and use of each instrument exhibited, a short description of its construction and peculiarities. The entry in the catalogue, when mounted on cardboard, served also as a label, which was attached to the instrument in the collection. In this way it was hoped that as much information as possible for instructional purposes would be afforded. Unfortunately, some of the exhibitors, more especially among the French, omitted to comply with this request, and there are consequently several instruments of the use of which only experts could have any notion. For example, among the instruments used for research and experiment on light, and classified in the catalogue under "Miscellaneous," is exhibited by the Paris Observatory a piece of apparatus consisting of a number of toothed wheels something like a clock, which is labelled merely "971A, Wheatstone's Apparatus," and the catalogue itself gives us no further information. Now, as the late Sir Charles Wheatstone devised some hundreds of different kinds of apparatus which all bear his name, only a person having a thorough knowledge of the science could say what this one is.

Again, M. Golaz, of Paris, has sent a collection of beautifully constructed instruments, made under the direction of M. Regnault, for use in his inquiries on Specific Heat; these are only labelled "Regnault's Apparatus for ascertaining the Specific Heat of Gases," "Regnault's Apparatus for determining the Tension of Vapour," &c. Surely a few lines of description of the method of using and the arrangement of these fine instruments, would greatly have enhanced their value from an educational point of view. When, however, so much has been well done, this may be considered as a trivial failing; with a very few exceptions the objects in the Exhibition are correctly labelled and fully described.

Before giving a description of the collection, it may be as well to point out that it has not been arranged in the order of sections as above classified. Many circumstances rendered such an arrangement impossible. The various shape and sizes of the instruments to be shown, necessitate allotments of space suitable only to the different sections. For instance, the sections of Geography and Geology, where many maps and plans have to be exhibited, require much wall-space; that of Applied Mechanics, which consists principally of models, and sometimes heavy machines requiring separate foundations, must have an allotment on the ground floor. Optical and other delicate instruments,

must be placed in glass cases. Again, the means of lighting requires careful consideration; some apparatus need a strong, and perhaps a top light, others may be best seen in comparative darkness. These requirements necessitated in some cases that objects should be placed away from their class. Thus, M. Pictet's ice-making machine, which should be properly classified with the instruments of heat, was placed close to the Gramme's and other magneto-electric machines shown in motion, as it is driven by a steam-engine. The same may be said of the "Times" Type-composing Machine, which, if placed according to its proper classification, should have been in the section of Applied Mechanics.

To adhere strictly and systematically to a scientifically arranged classification, is also in practice a very difficult matter. Thermometers may be fairly considered to be heat instruments, but they are also used in meteorological observations, and in the Exhibition they will be found both in Sections 8 and 14. So microscopes are considered by many persons to be purely optical instruments, but in view of the purpose for which they are principally used, they can also be regarded as biological apparatus, and in the latter sense they are classified here. The introduction of the section of Measurement was also productive of a little confusion. By far the larger number of philosophical instruments are made so as to effect measurements of some sort, for nearly all have scales attached to them, or can have them applied. This is also shown by the large use of the affix "meter" in the name of the instrument—as, for instance, thermometer, barometer, heliometer, hydrometer, electrometer, galvanometer, and so on. It was, therefore, a task of some difficulty to fix the most advisable limits of the section Measurement. Even with all the care exercised, the result was not quite satisfactory; the chemists were wroth that balances were not included in Section 13, while few persons could understand why hydrometers should be placed in Molecular Physics.

To give a detailed account of the Exhibition, or to describe the most prominent objects it contains, would far outrun the limits within which this article must be compressed. The catalogue alone forms a bulky octavo volume of over 1,000 pages; in the small space at our disposal, it is obvious that even the most interesting and valuable instruments can be but cursorily indicated. In our sketch of the Exhibition, we shall follow the geographical order, that is, the order in which the sections are arranged, and for the most part that in which a visitor would meet with the instruments as they are enumerated. To any one who has made himself acquainted with the collection, this will probably serve best to recall it to his recollection, while it will not inconvenience the reader who has not had an opportunity of seeing the Exhibition, nor prevent him from forming a scientific idea of the whole. Entering by the gate in the Exhibition Road, opposite the Science Schools of the Science and Art Department,

we find the first gallery occupied by the models and apparatus forming the Educational Section of the South Kensington Museum. At the end of this we enter the Special Loan Collection proper; in the next gallery is arranged the Section 19—last in point of classification, though first in the order now taken.

Educational Appliances.—Collections of apparatus for use in the school or lecture-room, for teaching Chemistry and Natural and Mechanical Physics and other branches of Science, are shown by several exhibitors, both in this country and on the Continent. The instruments which they display are all very much alike in appearance and arrangement, the same forms being reproduced as if from one common type. Perhaps the foreign manufacturers have the advantage in any originality which is displayed, as they have decidedly in accuracy of workmanship and beauty of finish. The Upper Board of Mines (Oberbergamt) of Breslau sends a selection from the collection of school apparatus for teaching the elements of Physical Science in the public elementary schools of the mining districts of Prussia, particularly Silesia, Posen, and old Prussia. Nearly a half of the next gallery is occupied by a large collection of school apparatus from the Pædagogic Museum of St. Petersburg. It consists of models illustrating Natural History and Ethnology, arithmetical and geometrical apparatus, maps and diagrams for teaching Geography and Astronomy, glass and wooden models of crystals, &c. All these are good of their kind, especially the anatomical models prepared by Strembitsky, though there is nothing particularly novel in their design or execution.

Applied Mechanics.—The next section in order of arrangement is that of Applied Mechanics; it occupies all the remainder of the space appropriated to the Exhibition in the galleries south of the Horticultural Society's Gardens. It comprises models and machines to illustrate or represent inventions and projects in mechanical and civil engineering, besides models and diagrams of marine architecture and lighthouse apparatus.

With great advantage we can here study the history of the steam-engine in its various forms, which is very fully illustrated. There is a model of Savery's engine, and one of the cylinders of the machine made at Cassel by Denis Papin. Then we have two models of Newcomen's engine, one from King's College, the other from the University of Glasgow. The latter possesses peculiar interest from its being the actual model of Newcomen's engine which was sent to James Watt to repair, and which, while in his hands, led to the introduction of the great improvements associated with his name. Other improvements in the steam-engine and discoveries of Watt are represented by a collection of his original models presented to the South Kensington Museum by Mr. Gilbert Hamilton.

The story of the locomotive is also well told. We have the original model of Trevithick's locomotive engine, and the actual first locomotive which ran on a smooth rail, "Puffing Billy," as it is called. Opposite this is Stephenson's prize engine, the "Rocket."

Of the marine steam-engine there are also several examples from the original engine of the *Comet*, the first steamboat in Europe advertised for the conveyance of passengers and goods, to the model of the first engine with oscillating cylinders, invented by Mr. H. Maudslay. In connection with the steam-engine are shown several inventions, in which other expanding gases are used instead of steam. Such is the air-engine invented by Robert Stirling, of which a model made by the inventor is exhibited by Sir W. Thomson. A diagram of a hot air-engine, in which the expansive force of hot air is employed to drive the piston, is shown by Professor von Gizycki, of Aachen ; and an atmospheric gas-engine, in which a vacuum is effected by the explosion of a mixture of common coal gas and atmospheric air, is contributed by Messrs. Crossley, of Manchester. Applications of the steam-engine are numerous. Models of the steam fire-engine, of the locomotive for common roads, of Nasmyth's steam hammer, and the steam pile-driving machine, are exhibited.

Of general machinery we should notice the first hydraulic press ever made, patented by Bramah in 1795, and the models of the block-cutting machinery, invented by Brunel for Portsmouth Dockyard. For instructional purposes there are the large collection of models and diagrams used in the Mechanical Lecture Room of the School of Mines, and the smaller ones for the same purposes from King's College, and the Geological and Mining Institute of Berlin.

Naval Architecture is very largely represented. Taking in order, as we pass along the gallery, the objects most worthy of notice, we come first to the *Faraday*, a steamship built expressly for laying ocean telegraph cables. Close to it is the *Shakespear*, a fast-sailing ship of 1,800 tons, with four masts, lately built to make the voyage to Australia in fifty-six days. Messrs. J. and G. Rennie have sent models of H. M. gunboats, *Arrow* and *Bonetta*, built in 1871, each to carry an 18-ton gun ; also of the *Mermaid*, afterwards named the *Dwarf*, the first screw steamer in the British Navy, purchased by the Admiralty on condition that she should run twelve miles an hour. Compare with these the twin-screw iron-clad gunboats, *Colombo* and *Cabral*, built by the same firm for the Brazilian government ; these have a raised centre-deck, carrying four 68-pounder guns, which point fore and aft ; and H. M. twin-screw gunboat, *Staunch*, built in 1868. by Messrs. Mitchell and Co., carrying one 12½-ton gun. A specimen of a ship, intended for a special purpose, is the Indian Famine Relief Steamer, built by Messrs. Rennie in 1874, with engines and all complete, in thirty-five working days. Next we come to armour-plated war-ships of various descriptions, built for our own and foreign navies. There is the model of the unfortunate turret ship, *Captain ;* of the twin-screw turret vessel, *El Plata*, built by Messrs. Laird Brothers, for the Argentine Confederation ; of the *Fu-shêng* and *Chien-sêng* gunboats for the Chinese government, by the same builders, each carrying an 18-ton Vavasseur gun. As samples of the modern iron-clad

broadside man-of-war, there are the models of the *Kaiser* and *Deutschland*, built by Messrs. Samuda, for the Imperial German Navy. Compare with these the old East Indiaman, *Falmouth*, built in 1752, by Messrs. Green. Of sea-going batteries there are the old forms of the *Trusty* and the *Glatton*, belonging to the British Navy; the circular iron-clad *Popovna* of the Russian Navy, propelled by six screws; the *Vasco di Gama*, built for the Portuguese Government by the Thames Shipbuilding Company, with a single central battery, and the *Avni Illah*, by the same firm, for the Sultan of Turkey, with a double central battery. The Thames Shipbuilding Company also show the model of the *Pervenetz*, built by them for the Czar of Russia; this is a ram, with a peculiar extended stern to protect the screw. At the end of this gallery is the model of the *Jumna* troopship, the sister ship of the *Serapis*, in which the Prince of Wales made his voyage to India last year. Near it is the *Castalia*, a twin ship, with inside paddles, built on Captain Dicey's plan, to relieve us of the horrors of the Channel passage, and a model of the curious-looking steamers which ply as ferry-boats between Liverpool and Birkenhead. Here, also, are the models and photographs illustrating Mr. W. Froude's most interesting and ingenious experiments on the resistance to the motion of a ship through the water due to its form.

Turning the corner into the next gallery, we come to the very complete collection of Lighthouse Apparatus, contributed by the Lighthouse Service of France, the Trinity House, and the Commissioners of Northern Lights. The first of them have sent the original lenses, dioptric and catoptric, designed by Fresnel. We can contrast these first attempts with the great annular lens made by Messrs. Barbier and Fenestre. Catadioptric apparatus were only used in England in 1836, and one of the lenses made on Fresnel's principle, for the Start Point Lighthouse, is here shown by the Trinity House. Messrs. W. and T. Stevenson, of the Northern Lighthouse Office, exhibit various forms of fixed and revolving apparatus, embodying all the improvements on Fresnel's system, which have since been adopted. Models of the lighthouses themselves are numerous; there are, among others, those of the Eddystone Light, completed in 1759, the lighthouse now building on the Little Bass Rock, seven miles from the coast of Ceylon, and that erected in 1853, on the Bishop Rock, in the Scilly Islands. Several forms of the new invention, the steam siren or fog-horn, which is to indicate the position of the lighthouse during a fog, are also shown, among them a drawing of the apparatus used on the Austrian coast of the Adriatic.

At the termination of this room, what philosophers term a break of continuity occurs; the next two galleries are occupied by Mr. Frank Buckland's piscicultural apparatus and fish museum, which for some years past have had a home here. Passing through these, we ascend the stairs at the end, and find ourselves in a long gallery where are exhibited the instruments belonging to Sections 5, 6, 7, and 8. On the stair-

case, we must not pass without notice two objects which are arranged there for the sake of convenience, though separated from the apparatus of the sections to which they belong. The first of them is General Perronet Thompson's enharmonic organ, a musical instrument which is capable of being played in twenty-one different keys; it contains diatonic semitones and kommas, differences of intonation which are unknown on the organ with the ordinary key-board. The second is Mr. Jordan's glycerine barometer, an improved form of the water barometer.

Sound.—On the left of the room as we enter, are the instruments belonging to Section 6, Sound. Prominent among these is a stand of apparatus illustrating the progress of Eolian principles, exhibited by Mr. Baillie Hamilton. Singing flames, as a source of sound, are shown by several contributors. They are also made use of to show the effects of the interference of sound waves, as in the apparatus from the Physical Laboratory of the University of Groningen, in Holland; Professor Tyndall employs the singing flame in the instrument, which he shows, to demonstrate the reflection of sound at the common surface of two volumes of air of different densities. Of instruments for measuring the length of the sound-wave, and the rate of its transmission, there are many in the Exhibition, and among them the original apparatus by which Professor Colladon, of Geneva, ascertained the velocity of sound in water. Different forms of the siren are shown by Professor Guthrie, Professor Lloyd, and Messrs. Yeates, of Dublin, and a set of Savart's toothed wheels by Messrs. Elliot Brothers. The last named manufacturers also exhibit an apparatus to determine the inferior limits of audibility, and a set of whistles for producing shrill notes within and beyond the superior limits, is contributed by Mr. Francis Galton, F.R.S.

Similar to the enharmonic organ already noticed, is the harmonium lent by Mr. Bosanquet. Mr. W. Chappell has sent the models of several ancient Egyptian reed-pipes, found in the tombs, and now preserved in the British Museum, and the Egyptian Museum at Turin.

Molecular Physics.—The instruments belonging to this section are exhibited opposite those just described. Most interesting among them are the air-pumps, of which a large number are shown. The first experiments in the application of the principle of the common pump to the exhaustion of air were made by Otto von Guericke, Bürgermeister of Magdeburg, in 1654, and two of the original air-pumps made by him have been contributed to the exhibition. Both these are accompanied by the original double hemispheres of copper called the Magdeburg hemispheres.

We have also the double-barrel air-pump, made by Hooke for Boyle, in 1662, and Van Musschenbroek's air-pumps made at Leyden, in 1786, with an oblique single barrel. Sprengel's mercurial air-pump is shown by Messrs. E. Cetti & Co., and an improved form by the Physical Laboratory of the University of

Groningen. There are several kinds of apparatus for condensing and dissolving gases, more especially the original apparatus of Thilorier for liquefying carbonic acid, contributed by the Conservatoire des Arts et Métiers.

Light.—The beautiful workmanship, delicacy, and elegance of the modern instruments exhibited in this section have not failed to make it, to the student, one of the most interesting in the exhibition, while the discoveries in this branch of Physics made during the last twenty years render it not less popular with the general public. Among the historical apparatus are the original stereoscope and kaleidoscope of Sir David Brewster, and the original instruments for determining the velocity of light of Fizeau and Foucault, contributed by the Ecole Polytechnique of Paris. Spectroscopes are now so generally used in physical researches that it is no wonder they are largely represented here. All the best makers of Europe have sent specimens of their work. The value of this instrument is illustrated in the exhibition by Mr. Roberts, the chemist to the Mint, who shows an arrangement of apparatus for experiments on the assay of gold alloys by means of the spectroscope, as suggested by Mr. Lockyer.

Instruments for investigation on polarized light are also numerous. We have the polar clock of Sir C. Wheatstone, by which the true solar time can be determined by the polarization of light reflected from the sky; various forms of Nörremberg's polariscope, by different makers, and a few polarizing saccharometers. Fine collections of prisms and lenses of different kinds of glass, and different crystalline substances, as rock salt, quartz, and Iceland spar, are sent by M. Feil and M. Laurent, of Paris.

Photography, as an application of light, has appropriately been placed in this section. Historically interesting are the second Daguerreotype ever taken, the first known photograph on glass by Sir J. Herschel, and photographic prints by M. Niépce de St. Victor. Specimens of printing from reliefs obtained by photography by the Woodbury, the autotype, and the heliotype processes are shown. Photographic lenses of high excellence have been sent by Mr. Ross and Mr. Dallmeyer, both of London, and the Chevalier von Voigtländer, of Brunswick.

Heat.—Thermometers, considered as instruments merely for measuring heat in different bodies, are shown here by foreign and English makers of the highest reputation. Considered as meteorological instruments, they are also exhibited downstairs in Section 14. Mr. John Williams proposes a scale for the thermometer, in which the freezing and boiling points of mercury are taken as the standard points, the interval between them being divided into 1,000°. On the scale of this milligrade thermometer, as he calls it, the freezing of water occurs at 100°, and the boiling at 350°: the instrument is exhibited.

Several examples of the pyrometer, on different principles, are contributed to the Exhibition. There is Wedgwood's clay pyrometer, shown both by Mr. Garner and the Edinburgh Museum

of Science and Art. Dr. Siemens has sent his water pyrometer and his electrical pyrometer. A pyrometer on Musschenbroek's principle, made in the early part of last century, is sent from Breslau, and King's College, London, has sent the instrument invented and used by the late Professor Daniell.

The Collége de France contributes the original apparatus of Regnault, and the Ecole Polytechnique of Paris that of Dulong, for ascertaining the specific heat by refrigeration, and the Conservatoire des Arts et Métiers has sent the original calorimeter of Lavoisier. Dr. Andrews exhibits the apparatus by which he measured the amount of heat produced in the combination of oxygen with other gases, and also with liquids and solids.

The ice-making machine of M. Pictet, of Geneva, is shown at work in the annexe outside the electricity gallery downstairs. In this apparatus the inventor makes use of sulphurous acid, which is condensed by a force-pump moved by a small steam-engine, and on being liberated volatilizes, producing great cold, and converting quickly the water to be frozen into ice. M. Carré shows an ice-making machine for domestic purposes, in which cold is generated by the evaporation of the water itself.

Chemistry.—On quitting the gallery where are arranged the apparatus and instruments belonging to the four sections which have just been described, we enter that devoted to chemical apparatus and products. Of the former there are different kinds of apparatus, used for special operations and analyses in the laboratory; of the latter some collections of rare and interesting chemical substances and compounds, exhibited by the first chemists of England and Germany, as well as several series illustrating industrial or technical chemistry.

But it is in the relics and historical apparatus used in the great discoveries of chemistry by eminent philosophers long passed away that this section is most rich and interesting. We have a large collection of original apparatus used by Dr. John Dalton, the discoverer of the atomic theory, besides a frame containing proofs in his own handwriting of part of his work, the "New System of Chemistry," in which this discovery was made known. These have been contributed by the Literary and Philosophic Society of Manchester. Then there are the original balances of Cavendish and Sir Humphrey Davy from the Royal Institute; also that of Black from the Edinburgh Museum, and that of Priestley, lent by Mr. Ward. From the Royal Institution we have also the laboratory note-book containing Davy's record of his decomposition of potash, and Faraday's notes of his condensation and liquefaction of gases; and, to accompany the latter, the apparatus used by Faraday to effect the condensation, together with the original tubes containing the gases thus liquefied. The Collége de France contributes a quantity of apparatus used by, and original preparations made by, the French chemist Berthelot; among them is a small flask containing alcohol, obtained synthetically by the union of olefiant gas

with water. A number of remarkably simple appliances, by means of which the late Mr. Graham discovered and demonstrated the laws of Osmosis and Dialysis, or the diffusion of liquids and gases, is contributed by Mr. Chandler Roberts, the chemist to the Mint.

Passing out of this gallery through the larger hall used during the Exhibition for lectures and meetings, and called the Conference Room, we enter the gallery in which are arranged the instruments and preparations grouped under the section of—

Biology.—In this section are exhibited all the apparatus used in the study of animal and vegetable life. Instruments are here arranged of the utmost delicacy and precision, not only for investigating, but also for recording and measuring the complex phenomena of the vital functions.

Thus, the Physiological Institution of Prague contributes a very complete collection for registering and investigating the functions of respiration and circulation. A large number of instruments for various purposes is sent by the Physiological Laboratory at Utrecht; among these particularly are several for determining and demonstrating the laws of physiological optics, and most interesting of all a noematograph, as it is called, or an instrument for recording the time of physical processes. Dr. Marey, Professor of Physiology at the Collége de France, shows a very complete collection of the apparatus he has designed for registering physiological phenomena.

Anatomical preparations and skeletons, both of the lower animals and of the human body, as also models of the same, are numerously represented.

From the Linnæan Society we have examples of Linnæus's own MS. as well as some of his original specimens, and from the Royal Gardens at Kew specimens of rare plants, and collections illustrating special orders indigenous to Australia and the Tropics. Professor Cohn, of the Institute of Vegetable Physiology in the University of Breslau, exhibits an apparatus for the germination of seeds, and the cultivation of microscopical organisms; also a number of beautifully constructed models of the organs of different plants.

A large number of microscopes are shown by the most celebrated makers of this country and the Continent. Of historic interest are the first compound microscope made by Janssen in 1590, the small instrument used by Leeuwenhoek, and the two constructed by Musschenbroek in the latter part of the seventeenth century.

Geology.—On entering the next gallery perhaps the first thing that strikes the attention is the different appearance it presents to the rooms through which we have already passed. Here maps are the great feature of this portion of the Exhibition; maps of all sorts and sizes not only cover the sides of the room, and screens erected on the floor on purpose for displaying them, but they overflow on to the staircase beyond, the walls of which also are completely filled by them. In this gallery are arranged

the sections of geology and mineralogy, and part of that of geography.

A large number of geological maps and sections are exhibited. Most noticeable are the first geological maps of England, one by Wm. Smith, published in 1815, and the second by G. B. Greenough in 1819. There are also the maps and sections of the Geological Survey of the United Kingdom, Sir W. Logan's map of Canada, and Dr. Hector's map and model of New Zealand. The Mining Institute of St. Petersburg sends geological maps of Russia, and Dr. Gümbel, maps of the Fichtelgebirge and the Bavarian Alps. We have also maps of the coal and mining districts of Silesia, and of the Saarbrück coal basin. Several geological models and raised maps are contributed by different exhibitors, and there are numerous geological collections of rocks and fossils. Among the latter we can only notice the collection of fossil plants of the Tertiary period, made and arranged by the Baron von Ettingshausen of Gratz. Of special interest are the specimens contributed by the Sub-Wealden Exploration Committee.

A collection of safety lamps of various designs is exhibited by the North of England Institute of Mining Engineers, and in connection with this should be noticed the original lamps made by Sir H. Davy, lent by the Royal Society, as well as the rudiments of apparatus constructed by the same eminent chemist during his researches on the safety lamp, from the Royal Institution.

Mineralogy.—Among the blowpipe apparatus exhibited will be found the original blowpipe of Plattner, lent by the celebrated Mining Academy of Freiberg; and among the goniometers the original instrument of the celebrated mineralogist the Abbé Haüy. Reflecting goniometers are shown by several exhibitors.

Minerals and models of crystals are very largely represented. Particularly worthy of attention are the rare and beautiful mineralogical specimens from the Ural Mountains, contributed by the Mining Institute of St. Petersburg, some of which are of extraordinary beauty.

Geography.—The apparatus and appliances exhibited in this section naturally separate themselves into two principal divisions. First, we have survey and geographical instruments; and, secondly, the maps or results obtained by those instruments. In the gallery whose contents we are now describing, the appliances coming under the second of these heads only are exhibited; the instruments are shown downstairs in the same room as those under the section of Astronomy, to which, indeed, they approach closely in character.

The Royal Geographical Society contributes the original maps of the great explorers of Africa, and among them the manuscript charts of Livingstone, Burton, Speke and Grant, Sir S. Baker, and H. M. Stanley.

In the conference-room are placed several charts illustrating Arctic and Antarctic exploration, and some sketches of African tropical scenery, from drawings made by Commander Cameron during his late expedition.

From the Hydrographic Department of the Admiralty we have a set of logs and journals kept by celebrated English navigators. This includes Dampier's chart of his voyage in 1699–70; Captain Cook's journals, from 1768 to 1775: Captain Bligh's log, containing an account of the mutiny of the *Bounty*; Sir E. Parry's logs and journals in the *Hecla*, 1819–20, and the *Fury*, 1821–23. A copy of the chart of the coast of America, discovered by Columbus in his second voyage, and made by the pilot who accompanied him in the year 1500, is contributed by the Archæological Museum at Madrid.

Of topographical survey maps there is a highly valuable exhibition. Our own Ordnance Survey have sent specimens of all the surveys on which they have been or are now engaged. The great Indian Survey is represented by a selection of maps lent by the Secretary of State for India. From Spain there are a number of publications illustrating the progress of cartography and surveying in that country, exhibited by the Institute of Geography and Statistics at Madrid. Russia lends some of the plans of her Ordnance Survey, and Germany plans taken in the Survey Department of the Royal Prussian General Staff at Berlin. The Board of Works of Hamburg have sent many maps and models, the results of surveys of that city made at different times. Last, but not least, there is a number of plans of the Survey of the Holy Land, executed for the Palestine Exploration Fund by Captain Warren, R.E., and Lieutenant Conder, R.E. The survey of the bed of the sea is illustrated by the charts and plans of the Hydrographic Department of the British Admiralty, and also by maps of the Baltic, sent by the Hydrographic Office of the German Imperial Admiralty.

To examine the apparatus used in surveying at sea and on land, we have to descend the staircase and enter the long gallery where are also exhibited the astronomical and meteorological instruments. For marine surveys and deep sea sounding, the Hydrographic Department of the Admiralty show special sets of instruments; also a set of survey instruments as supplied to the expedition in H.M.S. *Challenger*. Other instruments for nautical surveys are exhibited by numerous manufacturers, both here and on the Continent; there are sextants, and artificial horizons, and compasses, both ordinary and prismatic. The Royal Geographical Society of London contribute the instruments used by the late Dr. Livingstone on his last journey, and also those brought back from Africa by Commander Cameron.

The instruments used in the great trigonometrical survey of the United Kingdom have been sent from the Ordnance Survey Office. Among them are Colby's compensation bars, for measuring a base line, theodolites by Ramsden and Troughton and Sims, and Airy's zenith sector. The Ordnance Survey Department of the Royal Prussian Survey Staff at Berlin also contribute a set of surveying instruments; and the Secretary of State for India photographs of the principal instruments designed by the late Colonel Strange for the Trigonometrical Survey of

India. By many other English and foreign contributors there are exhibited numerous surveying instruments of various kinds, principally theodolites and levels. To enumerate even a small portion of these would quite outrun the space at our disposal.

Astronomy.—As may be surmised, this, the most ancient of all the physical sciences, is the richest in the exhibition of instruments of historical interest. To go carefully through this section is, in fact, almost to record the story of the progress of astronomical research from the earliest ages.

The oldest dated astrolabe is the one made in 1525, contributed by Professor Buys-Ballot, of Utrecht; but a far finer instrument, though bearing a date thirty years later, is the astrolabe which belonged to Philip II of Spain, and is now lent for exhibition by the School of Mines at Madrid. An astronomical circle, made in 1572 by Walter Arsenius (the maker also of Philip II's astrolabe), is sent by the Director of the Observatory at Leyden; and from the same exhibitor is a planisphere of 1601, by Coignet, of Antwerp. From Breslau there have been sent several old quadrants, the property of Prince Pless, of Fürstenstein. But of all the instruments in this section, the most interesting and valuable is probably the original quadrant of the great Danish astronomer, Tycho Brahe. Then there is a quadrant lent by the University of Edinburgh, and said to have belonged to the celebrated Napier of Merchistoun, the inventor of logarithms; and two French quadrants, of the middle of the 18th century, one made by Langlois, lent by the Paris Observatory, and one by Butterfield, sent from the Observatory at Kew. What is called an azimuth quadrant comes from the Leyden Observatory; it is by Uletz, and has the date of 1700. Of special interest as a relic is the quadrant used by Captain Cook, lent for exhibition by Dr. Caulfield, of Cork.

The history of the telescope is fully illustrated. We have the original telescope of Galileo, contributed by the Institute of Studii Superiori in Florence, as well as one of the astronomical telescopes made by Huygens, and lent for exhibition by Professor Rijke, of Leyden. Partly contributed by the same exhibitor, partly by the Royal Society, there is also a collection of lenses ground and polished by Huygens. Of old reflecting telescopes there are several specimens in the exhibition, and among them one made and used by Sir Isaac Newton himself. There are also three telescopes made by Sir W. Herschell—one belonging to the Royal Astronomical Society, a second in the possession of Mr. E. Smith, of Bath, and a third lent by the Director of the Radcliffe Observatory at Oxford. The second of these instruments was made and used by Sir W. Herschell while organist of the Octagon Chapel at Bath; it is probably the same with which he discovered the planet Uranus in 1781. Of more modern reflecting telescopes the most celebrated is the large instrument, having a speculum or mirror 6 feet in diameter, erected by the late Lord Rosse at Parsonstown, in Ireland. One of the earlier attempts of Lord Rosse to construct a large

speculum for a reflecting telescope is shown in the exhibition; it has a diameter of 2 feet, and is made up of a number of laminæ of speculum metal laid side by side and soldered on to a backing made of a zinc-copper alloy. A large number of modern telescopes, both refractors and reflectors, are exhibited; these are shown either mounted equatorially, as transit circles, or as altazimuth instruments, and are manufactured by nearly all the principal makers in Europe. Perhaps the most remarkable of the modern astronomical instruments is the transit instrument invented by Dr. Bruhns, of Leipzig, and constructed by Messrs. Lingke, of Freiberg; it can advantageously be compared with the model of the old Greenwich transit, which is shown close to it.

Mr. Grubb, of Dublin, sends the models of two large equatorial instruments constructed by him. The first of these is a reflecting telescope with 4 feet mirror, completed in 1868 for the Melbourne Observatory; the second is a refracting telescope still in course of construction, and intended for the Imperial Observatory at Vienna.

A set of instruments, made expressly for one of the stations for observing the Transit of Venus in 1874, is contributed to the exhibition by the Astronomer Royal. This consists of an altazimuth, transit, and equatorial, made by Troughton and Sims, and a photoheliograph by Dallmeyer. Each instrument is placed in the hut made expressly for it, and is accompanied by an astronomical clock by Dent. They are exhibited in the gallery upstairs, above the arcade of the Horticultural Gardens, and outside the conference room. In one of the huts is the model designed by Sir G. Airy to train observers for the expedition in noting the exact instant of the ingress and egress of the planet.

The French commission for observing the Transit of Venus in 1874 have sent one of the photographing instruments used on that occasion, and an instrument of the same kind is shown by the French astronomer, M. Janssen. Dr. Schur, of Strasburg, contributes a Daguerreotype of the total eclipse of the sun in 1857, taken at Königsberg, and Mr. Warren De la Rue some beautiful photographic representations of the eclipse of the sun of 1860, taken in Spain.

Two large and beautiful heliostats or siderostats are (in addition to other smaller ones) shown in the Exhibition. Col. Campbell sends the heliostat designed by him, and executed by Mr. Hilger, of London, and the Paris Observatory contributes the magnificent siderostat of Foucault.

So large is the collection of astronomical instruments, that part of it has to be shown in the next gallery. Here are different forms of apparatus for determining the earth's motion and density, more particularly two forms of pendulum apparatus sent from the Observatory at Kew, one used in the trigonometrical survey of India, the other made for Sir E. Sabine, and similar to that supplied to the Arctic Expedition. Here, too, is the apparatus used by Bailey for repeating the Cavendish experiment, lent by the Royal Astronomical Society, and Gauss's

pendulum for demonstrating the rotation of the earth from the Göttingen Observatory.

Noticeable among the astronomical clocks are Messrs. Dent's clock with Sir G. Airy's barometric compensation, and a set of electric clocks by Messrs. Ritchie and Son, of Edinburgh. We have also a clock sent by the Postmaster-General which is in electric communication with the Greenwich Observatory, and shows the true mean time. And this clock in turn, by the electric current, fires every day at one o'clock a cartridge of gun-cotton suspended in the arcade overhead.* This arrangement is on the principle of the mid-day time gun at Edinburgh, the cannon in this case being replaced by the gun-cotton cartridge to avoid the concussion which the former would produce.

Meteorology.—To examine the instruments belonging to this section of the Exhibition, we must retrace our steps to the gallery where the bulk of the astronomical apparatus and surveying instruments already described are arranged. A properly equipped meteorological station is generally furnished with barometers for measuring atmospheric pressure, maximum and minimum thermometers for temperature, black and bright bulb thermometers for observing the amount of solar radiation, hygrometer for determining the moisture ot the atmosphere, rain-gauge for measuring the fall of rain, and anemometer for registering the force and velocity of the wind. Sets of instruments of this kind, more or less complete, are exhibited by the Meteorological Committee of the Royal Society, the Meteorological Society, and the Meteorological Office of the Board of Trade. Specimens of the same instruments, separately or in sets, are shown by most of the English and foreign instrument makers.

Instruments for automatically recording and registering atmospheric phenomena are numerously shown. More especially worthy of attention is the self-recording wind components integrator invented by Dr. Van Oettingen, of Dorpat, in Russia. Belonging to this section also is the set of automatic registering apparatus constructed by Mr. Adie, of Pall Mall, for Dr. Vogel, at the Observatory of Potsdam, on the model of those now in use at Kew. It is exhibited in a separate hut in the grounds outside the room where the clocks are shown. The instruments which belong to this set are a triple magnetograph for recording the diurnal fluctuations of the magnetic needle, as respects declination, variation, and intensity ; also a barometrograph and a thermometrograph, which register the movements of the barometer and thermometer.

Measurement.—The instruments exhibited in this section are intended to effect measurements of various descriptions. We have instruments for measuring length, as scales and callipers ; area, as

* The writer of this article, standing one day on the bridge over the ornamental water in St. James's Park, heard the clock at the Westminster Palace strike one, and the sound of the time gun at South Kensington, within five seconds of each other. The difference of time is accounted for by the difference of distance of the observer from the two points.

planimeters; mass, as balances; velocity, as chronographs; time, as chronometers and clocks. All these are numerously and well represented.

The appliances sent by Sir Joseph Whitworth display the marvellous delicacy and precision which he has succeeded in imparting to mechanical work. Here are surface plates so truly planed that when placed face to face and slid over each other so as to remove the film of air between them, the external atmospheric pressure causes them to adhere so firmly, that a considerable force is required to pull them asunder. Here, too, is the measuring machine which is able to appreciate a difference of one-millionth part of an inch. Dr. Joule has sent the different appliances which he used in his celebrated experiments for determining the mechanical equivalent of heat.

The Standard Department of the Board of Trade contribute a collection of the apparatus used in comparing and testing the standard measures. They also show copies of some of the standard weights and measures of which they are the guardians. Messrs. Siemens and Halske, of Berlin, exhibit a set of Russian standard measures of capacity, and a similar set of French measures comes from Messrs. Collot, of Paris.

Highly interesting is a collection of old standard weights and measures preserved in the Muniment room of Winchester, and lent for exhibition by the Mayor and Corporation of that city. Some of them are as old as the reign of Edward III. Equally interesting is the Scottish standard pint measure, called the Stirling Jug, which was entrusted to the borough of Stirling by the Scottish Parliament in the year 1437.

Dr. Siemens contributes an instrument for measuring horizontal attraction, as well as his bathometer, which is intended to measure the depth of the sea without the use of the sounding line. Both these instruments depend on the principle of the movement produced in a column or mass of mercury when under the influence of an attractive force. Mr. Allan Brown's gravimeter, which is also exhibited, measures differences of the earth's attraction by means of the torsion of a bifilar thread, from which a weight is suspended.

Kinematics, Statics, and Dynamics.—The instruments and machines for illustrating the science of Theoretical Machines, are arranged at the further end of the room containing the section of measurement, and in part of the room next to it. A large collection of Kinematic Models, to illustrate the application of the principles of Mechanics to Mechanism is sent by the Gewerbe Akademie of Berlin; they are copies of those designed and used by Professor Reuleaux for use in his lectures on the kinematics of machinery. Models of various link-works designed by Mr. Kempe in conjunction with Professor Sylvester, are contributed by the former gentleman. The link-work discovered by Col. Peaucellier is sent from the Conservatoire des Arts et Métiers. The Collége de France contributes Foucault's original gyroscope. Pendulum apparatus for obtaining the

beautiful curves produced by the combination of harmonic vibrations are shown by Messrs. Tisley and Spiller and Professor Knoblauch of the University of Halle, and Mr. Donkin exhibits his original machine for drawing the curves produced by the combination of two harmonic parallel motions.

Arithmetic.—Slide rules and calculating machines are the chief instruments shown in this section. Of the latter we have several old forms—Pascal's machine, dated 1642, is contributed by the Conservatoire des Arts et Métiers, Sir S. Morland's, constructed in 1664, and formerly belonging to Mr. Babbage, by General Babbage. Two other ancient calculating machines which belonged to Mr. Babbage are also shown; they were designed by Lord Mahon, and constructed in 1775 and 1777 by James Bullock. A different form of machine, designed by Hahn, of Echterdingen, and constructed by his son in 1809, is lent by the Duchess of Urach, and a similar machine, made apparently by the same mechanician, is sent by Professor Reuleaux. Mr. Babbage's celebrated difference engine, which was commenced in 1823, but never completed, was intended to calculate and print tables. A portion of it, which was put together in 1833, is exhibited by permission of the Board of Works. The best machine for performing the ordinary operations of addition, subtraction, multiplication, and division is that constructed by M. Thomas, of Colmar; the machine exhibited will work results to 16 digits.

Of a different character is Sir William Thomson's Tide Calculating Machine. This complex and intricate instrument, on certain adjustments being made corresponding to the port at which the tides are to be calculated, registers the height of the tide at any time of the day at that particular place. It is a beautiful illustration of the conversion of an analytical formula into a mechanical contrivance.

Geometry.—This section, which occupies the remainder of the room in which are arranged the kinematic models, although possessing objects of great attraction and high interest to mathematicians, contains little which is likely to claim the attention of the ordinary visitor. Mathematical and geometrical drawing instruments, including some of novel construction and for special purposes, are shown by several exhibitors. Models of geometrical surfaces are numerously shown, some of which are of great mathematical importance. The collection of ruled surfaces (represented by strings kept stretched by weights) constructed for the South Kensington Museum by M. Fabre de Lagrange, occupy a large part of the space allotted to the geometrical section. Other models are shown by some of the most eminent mathematicians in this country and on the Continent.

Electricity.—Entering the last gallery on our tour through the Exhibition, before we reach the bottom of the staircase which we have already ascended we find it tenanted by the apparatus included in the sections of Electricity and Magnetism. Not one

of the rooms whose contents we have already endeavoured to describe is more popular with the general public than this one. The recent discoveries in Electricity have been so valuable, and have brought the practical application of the science so much into direct contact, so to say, with every man's private life, that it is no wonder that this should be the case. It is only necessary to point to the development of electro-metallurgy, and of the electric telegraph, to prove the truth of the remark.

Machines for exciting electricity by friction are represented in all their various forms; we have the old arrangement of the cylinder and globe, Winter's improved plate machine, Armstrong's hydro-electric machine, and the induction machines of Holtz, Bertsch, Töpler, &c. The Leyden Jar, sent by the Teyler Foundation of Haarlem, should be noticed; it has five and a half square feet of coated surface, and is one of a battery of 100 similar jars used by Van Marum.

Galvanic batteries are, as might be expected, numerously shown. A set of elements, each one on a separate system, is contributed by the Conservatoire des Arts et Métiers. Mr. Warren De la Rue has sent 40 cells of his great chloride of silver battery which consists of 8,040 cells. Sir W. Grove's gas battery is shown by the London Institution. There are also several thermo-electric batteries, which are now being used for industrial purposes as electro-plating.

Of induction coils, one of the most remarkable is that of M. Ruhmkorff, which will give a spark of 18 inches, capable of piercing a 2½-inch cube of glass. An immense coil, made by Mr. Adie for the Polytechnic Institution, has lately been added to the collection. This mammoth instrument is 9 ft. 10 in. in length, has a primary wire 3,770 yards long, and 150 miles of secondary wire.

The magneto-electric machine is represented by several fine examples, especially those shown by the Société de l'Alliance of Paris. New and powerful machines of this class, invented by M. Gramme, are exhibited by M. Bréguet and M. Fontaine of Paris. A regulating electric lamp, on Foucault's principle, and constructed by Duboscq, is kept burning by one of these machines, driven by steam power.

The great discovery made by Faraday of an electric current induced by the action of the magnet, the principle on which the action of the magneto-electric machine depends, is completely illustrated by the original apparatus used by the celebrated philosopher. These are contributed by the Royal Institution and King's College, and also by Mrs. Faraday.

Instruments for measuring the potential of electricity are numerously exhibited; Sir William Thomson contributes a series of electro-meters, illustrating the improvements which he has successively introduced into this class of instrument.

Galvanometers also, of different designs and for various purposes, are sent to the exhibition by manufacturers from all parts of Europe. In connection with these instruments we should not

omit to notice a relic of great historical interest; this is the original work table of Ampère, the discoverer of the laws of the mutual action of voltaic currents, and the apparatus actually used by him in experimenting, lent to the exhibition by the Collége de France.

So great and rapid has been, during the last few years, the progress of electric telegraphy, that no surprise will be felt at its applications being very largely represented in the exhibition. Foremost, the authorities of our own Post Office have sent a complete series of instruments illustrating the entire history of the electric telegraph in this country, from the earliest needle instruments of Wheatstone and Cooke in 1837, to the modern printing and writing instruments on the Morse system now in general use. The Imperial Telegraphic Department of Germany also show the apparatus employed in that country. The French Telegraphs Department, in addition to some electrical apparatus, has sent models of the old aerial telegraph, on the systems of Chappé and Monge, in use before the invention of the electric telegraph. Mr. Culley exhibits a portion of the first telegraphic line laid by Cooke and Wheatstone in 1837, between Euston and Camden Stations, and Mr. T. R. Crampton a piece of the first submarine cable laid by him in 1851 between Dover and Calais. Earlier attempts at communication by electricity before the practicable invention of Wheatstone and Cooke, are illustrated by a portion of the telegraph laid by Sir F. Ronalds in his own garden in 1816, which is sent by Mr. Latimer Clark; also by photographs of the original telegraph apparatus used by Gauss and Weber, lent by the University of Göttingen.

Magnetism.—Of natural magnets we have the largest ever known, contributed by the Teyler Foundation at Haarlem; its weight, including the armature, is 335 lbs., and it will sustain a mass of iron weighing 250 lbs. The same institution also sends a large artificial permanent magnet weighing 62 lbs., which will keep in suspension a weight of 440 lbs. M. Jamin and M. Bréguet, of Paris, exhibit some large and powerful magnets constructed by the former of thin steel plates. Horse-shoe magnets of the metal nickel are shown by Mr. Gore, F.R.S., and the Edinburgh Science and Art Museum. Electro-magnets for experiments on diamagnetism come from Messrs. Elliott and Dr. Stone. Dr. Joule contributes a powerful electro-magnet, which when fully excited will retain its armature with a force of upwards of a ton. Tubular electro-magnets are exhibited by Mr. Faulkner, of Manchester.

The glass tubes prepared by Faraday for testing the magnetic and diamagnetic character of gases, are lent by the Royal Institution; also a box containing spheres, cubes, and bars of diamagnetic metals, tubes of various liquids, crystals, &c., used by Faraday in his researches on diamagnetism, is contributed by Professor Tyndall.

An instructive series of dip and intensity instruments is lent for exhibition by the Hydrographic Department of the Admiralty.

Instruments of various kinds for observing the diurnal and horal variations of the magnet, on the plan suggested by Gauss and Weber, are shown by several German exhibitors. Photographs of the apparatus now in use at the Magnetic Observatory of the University of Göttingen, where Gauss worked and made his great discoveries of the laws of terrestrial magnetism, are also shown.

Exhibited in this room, though not belonging to either of these sections, is the "Times" type-composing machine, of which some notice is necessary. Machines for composing and distributing type are no novelty; specimens of both are shown in the section of Applied Mechanics. The peculiarity of the machine now before us is that the distributing machine is replaced by an apparatus for melting and casting; by this arrangement are saved the labour and time of distributing the type which, even with the aid of machinery, is considerable.

Having now taken a rapid view of the Exhibition, there is but a very small space left to describe the means adopted to extend the advantages of the collection beyond the scientific man, to whom naturally it would be a centre of interest, to the general public, whose scientific knowledge would be more or less limited. The arrangements for this purpose were very complete and successful. For men of science, and those whose acquaintance with the instruments is familiar, a series of conferences were constituted somewhat on the principle of the meetings of the British Association, in which any one introducing some new experimental apparatus could explain its construction and object, and where, also, men of position in science should describe the latest developments of scientific research as illustrated by the instruments sent for exhibition in the collection. For the purposes of these conferences the sciences represented in the Exhibition were grouped under Physics and Astronomy, over which Mr. W. Spottiswoode, F.R.S., presided; Mechanics and Mathematics, President, Dr. Siemens; Chemistry under Professor Frankland; Biology, President, Dr. Burdon-Sanderson; Geography, Geology, and Meteorology, presided over by Mr. John Evans, F.R.S. The conferences were held during the latter part of May; unfortunately, at this time of the year, most of the scientific men on the Continent are entirely occupied with their duties as professors and teachers, and in consequence the number of those able to attend was not as large as could have been wished.

During the summer months series of lectures on the instruments in the Exhibition were delivered by some of the most eminent scientific men in the country. These were especially intended for science teachers, but were also open to the public on payment. For the general public gratuitous evening lectures on different branches of science were given throughout the summer, and were numerously attended.

The first step, then, towards the formation of a museum of physical and mechanical apparatus, as recommended by the Commission on Scientific Instruction, has now been made. That it has been a successful one is, as we venture to think, undeniable. But how and by what it is to be followed up is still a matter of uncertainty. Of course much of the apparatus sent to the Exhibition must necessarily be returned to the contributors; a large number of instruments, however, representative of discoveries and research in the whole field of science, would still be available to form the groundwork of a collection of the character indicated. A building for such a museum would not be wanting, for the Commissioners of the Exhibition of 1851 have offered the munificent sum of £100,000 in aid of erecting it, and the scheme meets with the almost unanimous assent of the scientific men of the country. In a memorial addressed to the Lord President of the Council, and signed by the President of the Royal Society, and all the members of the Committee of the Exhibition, it is urged that the objects which may be voluntarily left, or can be purchased at the close of the Loan Collection, will, with those contributed from the existing Patent Museum, and other public departments, be highly suitable to form the nucleus of a Museum of Pure and Applied Science.

In a future volume of the "Companion to the British Almanac," the establishment of this Museum will, we hope, be recorded. If the success of the Special Loan Exhibition may be taken as an omen, that of the Museum, to which it should be the stepping-stone, is assured.

THE SEWING MACHINE; ITS INDUSTRIAL AND SOCIAL RESULTS.

For upwards of a century the possibility of constructing some kind of mechanical apparatus, by means of which the simpler descriptions of needle-work might be performed in an easier, cheaper, and more expeditious manner than by hand, had repeatedly engaged the attention of thoughtful and enterprising mechanicians, but it was not until within the last thirty or forty years that any results of a really practical and encouraging nature were obtained. Even so late as the period of the Great Exhibition in Hyde Park, the sewing machine, then a novelty to the general public, was regarded chiefly in the light of a mechanical curiosity. Its ingenious character was readily admitted, but its many obvious defects, all of which have since been remedied, occasioned a widely-spread disbelief in its utility for industrial purposes. Moreover, the prices given for needle-work were so extremely low, in consequence of the great superabundance of labour, that it seemed impossible still further to reduce them by

encouraging the use of machinery in place of hand labour. Yet, in less than ten years afterwards, the sewing machine had found its way into hundreds of establishments, principally in the United States, in which boots, shoes, and various other articles of male and female clothing, were produced in vast quantities; having completely revolutionised several leading manufacturing industries, and assisted in creating others of no mean extent and importance. According to official statistics published by the Government of the United States there were, in that country alone, in 1862, no less than 300,000 sewing machines in actual use, of which about 75,000 were to be found in private families. These figures will assist in furnishing some idea of the extent to which a considerable portion of American manufacturing industry had become affected by the introduction of the new invention.

To an American inventor, Mr. Elias Howe, belongs the honour of being the first to produce a really efficient mechanical contrivance for making stitches with a needle and thread, or rather two threads, in the same manner as if produced by the human fingers. But it would appear that on more than one occasion the successful result of Mr. Howe's labours had very nearly been anticipated in this country, for the records of the English Patent Office contain the specifications of a patent granted, so far back as 1790, to one Thomas Saint, of the city of London, for "an entire new method of making and compleating shoes, boots, spatterdashes, clogs, and other articles by means of tools or machines," invented by him for that purpose. The sheet of drawings attached to this specification illustrates, among other things, a machine for "stitching, quilting, or sewing;" and a working model which was recently constructed by a firm of machine manufacturers from the drawings and details given in the specification, shows that Thomas Saint had actually invented a most efficient apparatus, although he does not appear to have entertained any suspicion of its real industrial value. As the title of the patent does not direct attention to Saint's invention, it remained unknown until about a couple of years ago, when it was discovered during a systematic examination, for official purposes, of the various records and papers in the Patent Office. In 1844, Messrs. Fisher and Gibbons, of Nottingham, invented a machine for embroidering, which not only satisfactorily answered the expectations of its inventors, but was also, although unknown to them, within an ace of becoming an efficient sewing machine. With the addition of a needle and shuttle arrangement the machine was subsequently used for sewing purposes, the manufacturers being Messrs. Grover and Baker. The manner in which certain descriptions of embroidering are effected by means of a kind of hooked needle, which assisted in forming a peculiarly shaped loop, appears, in fact, to have suggested the original idea of the sewing machine, the description of stitch known as the "chain-stitch" being merely the embroidery stitch modified and reversed.

On the Continent an embroidering machine, which may be regarded as the parent of the modern sewing machine, was invented in 1755, by a German named Weisenthal. In 1804, a Brevet d' Invention was taken out in France for a kind of sewing machine, the specification describing how a number of these might be worked simultaneously by means of a vertical shaft. Nothing appears to have resulted from this, but in 1839 or 1840 another Frenchman, named Thimonnier, constructed a wooden model of a machine, which worked so satisfactorily that a company was formed, and, in 1841, a factory opened in Paris for the production of army clothing by the aid of the new invention. The Parisian artisans did not, however, relish the idea of the hand becoming supplanted by the machine, even though the former might be ultimately benefited. They assembled in large crowds, broke into the workshops, destroyed the machines, and compelled the terrified inventor to quit the French capital. He came over to this country and offered his invention to a Manchester firm; but, while admiring its ingenious character, they refused to recognise its practicability. Back went the disappointed yet still sanguine Frenchman to Paris, where he again set up his machines, but only to find that the Parisian workmen had not conquered their dislike to his invention. Like the English Luddites, they displayed the most inveterate hostility to the use of machinery. For the second time, they burst into Thimonnier's workshops, and demolished the obnoxious machines. Disheartened and worn out by the continued opposition of his enemies, the unfortunate inventor retired to Amplepuis, where he died in 1854, the victim of class prejudice and ignorance. Mr. Elias Howe, to whom the introduction of the sewing machine in a practical form is unquestionably due, nearly shared the cruel disappointment which attended the career of Thimonnier. A poor and unknown American artisan, working hard during the day to support his wife and family, he conceived the idea of constructing a workable sewing machine. To this purpose he devoted all his spare hours, allowing himself scarcely sufficient time for rest. As the possibility of ultimate success became apparent, he began to neglect his employment and devote himself more assiduously to the completion of his invention. Then came the sad and bitter experiences with which the stories of many celebrated inventors have made us familiar. Howe's family would have starved but for the generous assistance of a friend who believed in the practicability of the young mechanic's idea, and who was afterwards rewarded with a share in the patent granted by the American authorities to Howe. This was in 1841. Singularly enough, the merits of the invention were first recognised, not in the United States, but in England, whither Mr. Howe came in the hope of obtaining for his patent the appreciation which had been denied it by his fellow countrymen. But even in London, Howe found those to whom he showed his model indifferent or incredulous respecting its capabilities, and at last he was compelled by sheer necessity to sell

both model and English patent rights for the modest sum of £250, to a stay and corset manufacturer, named Thomas, who instantly perceived the applicability of the invention to his own trade.

Returning to New York, Howe had to endure the additional mortification of finding that, during his absence in England, his patent rights in the United States had been infringed, and his invention pirated, by wealthy but unscrupulous individuals, who apparently deemed that Howe's poverty would prevent any effectual interference on his part with their unjustifiable proceedings. But they little knew the determined and persevering nature of the man with whom they had to deal. He boldly took the case into a court of law, where, despite the formidable display of counsel and scientific men arrayed against him, he demonstrated so clearly his sole right to the invention, that it was impossible to refuse a verdict in his favour. This decision led, however, to unexpected results. The publicity given to the legal proceedings adopted by Howe for the protection of his patent rights, awakened general attention, on both sides of the Atlantic, to the immense advantages possessed by his invention, and orders for the new machine became so numerous that the once poverty-stricken and almost friendless American mechanic suddenly found himself not only famous, but also on the high road to wealth. In the meantime his antagonists had not been idle. Perceiving the enormous value of the prize which had so tantalizingly eluded their grasp, they commenced taxing their ingenuity in the construction of a machine which should be capable of producing the same results as that obtained by Howe, but without infringing the details of his patent. In this manner originated the long and remarkable series of improvements which have made the sewing machine one of the most ingenious and perfect labour-saving contrivances ever known. Scores of rival inventions made their appearance from time to time, each possessing some distinguishing characteristic or peculiar advantage; large works for the wholesale production of sewing machines were established both in Europe and in the United States; and thousands of skilled workmen found remunerative employment in the new branch of manufacturing industry thus unexpectedly created. Still, the demand continued to increase more rapidly than the means of supply, especially in America, where the deficiency of female labour had long retarded the natural development of many branches of manufacturing industry. Even at the present time, when upwards of 4,000,000 sewing machines are estimated as being in general use in various parts of the civilised world, there appear no indications of any decline in the rate of production; on the contrary, we frequently hear of the opening of works or the extension of those belonging to the older established firms.

During the litigation in connection with the infringement of Mr. Howe's patent, one of his counsel described the essentials of a good sewing machine as follows: (I.) A mechanism for making stitches, or interlocking of thread, in combination with an

apparatus for making tension on the thread, and drawing up and duly securing each stitch when formed. (II.) An apparatus consisting of two surfaces, between which the material to be sewn is contained, and which support it against the thrust and retraction of the needle, and in such a position as to permit the stitches to be drawn tight. (III.) An automatic, intermittingly feeding apparatus, which causes the material to progress, with a regular uninterrupted movement, between the holding surfaces in the intervals between the successive punctures of the needle, with an unerring absolute precision and uniformity of effect impossible to obtain by hand.

Howe was the first inventor who contrived to combine these various movements in one machine, but his feed-motion was defective. In all other respects his invention was perfect. The great mistake in the earlier attempts at constructing the machine was the endeavour to imitate the stitches made by hand, in which a needle and thread are used, the needle having the eye opposite the point. The first step towards success was made when a double-pointed needle, having its eye in the centre, was devised, whereby the continual inversion of the needle, which forms the characteristic of hand-sewing, was dispensed with. The end of the thread was attached to this central eye, and the needle was drawn through the cloth in alternate directions by grippers placed one on each side; the one above letting go its hold as soon as the needle was seized by the one below, and so on.

With the general appearance of the sewing machine in its present form, the public are tolerably familiar. Whatever may be the principle on which it is constructed, it consists of a small metal platform or table, from one end of which rises an arm. This arm, extending over the platform, has at its extremity the arrangements for alternately raising and depressing the needle, the parts connected with the seizing of the thread and forming thereby a complete stitch, being placed under that portion of the metal platform into which the needle descends. The whole is set in motion by a wheel, placed at the left end of the machine, and worked either by hand or by means of a treadle, or by steam power, according to circumstances. The three principal kinds of stitch formed by the sewing machine are the "lock-stitch," the "double-chain stitch," and the "single loop or chain stitch." The lock-stitch is formed by two threads, the upper one being carried by a needle with its eye near the point. This needle is driven through the fabric, carrying the thread with it. The needle is then partially withdrawn, so as to form a loop of the thread underneath the fabric. Through this loop the under thread is passed by means either of a shuttle or a revolving hook or circular needle, the former being the most largely employed. When the under thread is thus, either by shuttle or hook, passed through the loop, the needle is wholly withdrawn, carrying up the loop thread, and with it the under thread, forming a lock in the centre of the fabric. This description of stitch was first introduced in 1835 by Mr. Walter Hunt, of New York, but

there being no apparatus for producing the necessary tension to tighten the stitches, the machine proved useless. In the sewing machines now in use, the desired tension, both of the upper and lower threads, is effected by a singularly ingenious arrangement, which cannot, however, be properly explained without the aid of diagrams. The single-chain stitch is formed something in the manner of a crotchet stitch; the needle, with a fine hook at the end like a crotchet needle, being passed through the fabric, the thread placed in the hook. The hook is then withdrawn, carrying a loop of the thread through the material, and through the previously formed loops, so as to interchain the several loops one with another. The double-chain stitch is formed with two threads. The upper thread and needle are the same as in the lock-stitch machine, but the under thread is worked by a looper, which is of curved form, having two eyes with a groove between them, in which the thread, supplied from a bobbin on the underside of the platform, lies. This enables an open loop to be continually supplied to the needle, which passes on the inside of the head of the looper. During the descent of the needle the looper is withdrawn in a circular direction, leaving a loop of its thread round the needle, and the loop of the needle thread, which is still tight against the needle. As the needle is withdrawn this loop, by the friction of the thread with the fabric, bellies out, and before the eye of the needle has ascended above the point of the looper, the latter returns and passes a loop of the under thread through this needle loop.

Most of the sewing machines in general use are provided with certain appliances, principally the invention of a Frenchman named Chapin, for hemming, tucking, and binding. There is also a machine for making button-holes, besides numerous others constructed for special purposes, such as sewing straw plait, the soles of boots and shoes, and the like. There is, indeed, scarcely anything that the most experienced sempstress can perform with her needle which cannot be done much better and more cheaply by the sewing machine. As regards speed, the machine possesses an enormous advantage over the hand, being able to make from 500 to 800 stitches per minute, while the largest number which an expert needle-worker can make in the same space of time is from twenty-five to thirty. Moreover, the sewing machine can continue producing this enormously large number of stitches as long as its owner pleases; whereas an hour or two would suffice to weary a sempstress endeavouring to make thirty stitches per minute. Mr. D. K. Clarke, in his treatise on "The Exhibited Machinery in 1862," states that, at the lowest computation, one machine is fully equal to five handworkers; but since that time the improvements effected have been so numerous and of such a comprehensive character that it may be said, without the least danger of exaggeration, that one machine in the hands of a skilful worker can do as much, in a given space of time, as eight or ten ordinary needlewomen." Scarcely less important than the speed with which the stitches are made is their wonderful regu-

larity and perfect character. No human fingers, however skilful, can equal, much less surpass, the work produced by a good machine in competent hands. It has made bad workmanship, so far as mere stitching is concerned, simply impossible. Whether the material operated upon be stuff or velvet, the sewing is precisely the same, the only difference being in the description of thread or silk employed in feeding the needles.

The rapidity with which the sewing machine found its way into general use in the United States after the action commenced by Mr. Howe against the individuals accused of infringing his patent, contrasted forcibly with the apathy with which the invention was received when first brought under public notice. In less than five years from the delivery of the verdict there was scarcely an American establishment in which boots, shoes, and other articles of clothing were manufactured, where the use of the sewing machine was unknown. The increasing number of rival inventions naturally led to considerable litigation, and, in several instances, to the issue of injunctions against the sale or use of certain machines which were palpable infringements of existing patents; but every fresh obstacle seemed to furnish an additional stimulus to the inventive genius of Transatlantic mechanicians, to the great advantage of the industrial community, who found the new labour-saving contrivance approaching perfection more speedily than would have been the case if its manufacture had remained a close monopoly. The earlier machines were worked exclusively by hand, or with the foot by means of a treadle; but steam was subsequently employed, the result being a still larger economy of cost, time, and labour. It was estimated that each machine saved the employer to whom it belonged no less than two dollars, or about eight shillings and sixpence, per day in wages alone; and that, in 1862, the aggregate saving to the people of the United States from this source amounted to the large sum of £29,000,000 per annum. In 1875, the amount thus saved was roughly estimated at £100,000,000. But this is not all, for the use of the sewing machine has led to the systematic adoption of numerous other appliances of a labour-saving character, whereby the actual cost of production has become still further lessened, and brought down to the level of that in European countries where labour is both cheap and plentiful, a fact which partially explains the marked diminution in the quantities of boots, shoes, and ready-made clothing imported into the United States during the last few years.

In England the sewing machine was first employed in the manufacture of women's stays and corsets, of which several million pairs are annually produced, despite the numerous objections of a hygienic character urged against the use of such articles of attire. In earlier days, the pieces of jean or other material forming the stays were sewn together by needlewomen of the poorest class, principally the wives of seamen and dock labourers, whose earnings seldom averaged more than three or four shillings each per week. The work, which was performed at home, was

generally of a most inferior character, requiring very little instruction or experience. In London the stay-stitchers resided principally in Bethnal Green, Whitechapel, Shadwell, Limehouse, Poplar, and other parts of the East End. They were likewise found in large numbers at Greenwich, Woolwich, Portsmouth, Bristol, Ipswich, and similar places; also in Glasgow and Dublin. Several thousand stay-stitchers are said to have been employed by one London firm alone. The majority of the workers were not regular stay-stitchers, but took to the work only when they could obtain nothing better to do; a circumstance which frequently caused the supply of labour to vary considerably, and prove deficient when most required. To this absence of regularity and continuity in the supply of labour may be traced much of the readiness with which the sewing machine was adopted by the English stay-makers. It enabled them to execute their orders with greater punctuality and despatch. At the outset the machine was regarded with more curiosity than concern by the workpeople, who invariably ridiculed the suggestion that it might prove efficient for the purpose intended. Their incredulity was still further strengthened by the discovery of various defects in the working, but as these were removed, the real utility of the invention became apparent, and its use rapidly extended. The comparatively large earnings obtained by those who had acquired a knowledge of the machine prevented any real opposition, on the part of the hand-workers, to its introduction. Instead of protesting or striking against its use, they evinced the utmost eagerness to be permitted to work it. Moreover, there was no sudden extensive displacement of hand labour; the change being of a somewhat gradual character, partly by reason of the difficulty experienced in obtaining the machines from America, the only country where, at that time, they were manufactured; partly because of the absence of mechanics and others sufficiently versed in the construction of the machines to enable them to keep the various parts in proper repair and working order; and partly owing to the alarm occasioned by the legal proceedings initiated by the holders of Mr. Howe's English patent rights against all purchasers of sewing machines not made or licensed by themselves. Besides, the general public had yet to learn that the machine stitch was superior in every respect to that made by hand, and this prevented the manufacturers from attempting to immediately substitute machine-made goods for those manufactured by hand.

From the stay trade the sewing machine found its way into the trades connected with the production of shirts, mantles, dresses, trousers, coats, and other articles of clothing, both for males and females. In some of these the needlewomen could not, even by working very long hours, obtain more than 3*s*. or 4*s*. per week, and the public were continually being shocked by painful revelations concerning the large amount of destitution and misery found existing among a class of workers whose name was regarded, with much truth, as synonymous with toil of the severest de-

scription, and wages of such a scanty character as to make workhouse or prison life almost preferable. Hood's touching "Song of the Shirt," with its melancholy refrain, formed a remarkable indication of the sympathetic feeling which caused the English sempstress to become universally regarded as the type of all that was wretched and helpless. Bitter were the newspaper denunciations of the employers who offered such inadequate remuneration to their workpeople, but the demand for cheap clothing became in no wise decreased. Needlewomen's Aid Associations were started by well-intentioned individuals, but, so far as the great body of workers were concerned, the assistance afforded was of an infinitesimal character. In fact, it seemed as if nothing that could be said or done would prove of the slightest practical use. The appearance of the sewing machine upon the scene changed all this. Shirts were made more rapidly and more cheaply than before, but the workers were better paid, and did not work for so many hours. Instead of the labours of the needlewoman being prolonged to a most dangerous extent, averaging from sixteen to eighteen hours per day, it was found that ten or eleven hours sufficed to accomplish the quantity of work required of her. Singularly enough, the increased use of machine labour did not tend to diminish the demand for hand labour. By performing the heavier portions of the work, the sewing machine allowed the needlewoman's skill, formerly wasted in mere drudgery, to become concentrated on the finer and more delicate parts; in other words, it assisted in developing increased excellence of workmanship, which, in its turn, led to increased consumption, and, as a natural consequence, an increased demand for female labour. "It is not machines we want," said a manufacturer, "but women to work them." But this was not all. To properly work a sewing machine, a certain amount of intelligence and natural ability is required on the part of the worker, as in the case of other mechanical appliances. This occasioned employers to seek the assistance of a higher and superior class of female workers, and as this became known, large numbers of young women of of the most respectable description, who had formerly refused to become "slaves of the needle," sought and obtained employment as machinists. A much larger number, availing themselves of the facilities afforded by many sewing machine manufacturers or their agents, who accepted payment by small periodical instalments, became the proprietors of the machines on which they worked, and were consequently enabled to carry on their labours at their own residences, a circumstance which has tended to prevent the enormous development of the factory system, which at one period seemed inevitable. In the metropolis there are few professional needlewomen who do not possess machines of their own. Even the dressmaking and other work required by private customers is generally performed by machine instead of the hand, the workers frequently bringing their machines to the places where it is desired that the materials should be made up.

The nearest approach to anything like organized opposition to

the use of the sewing machine, at least so far as the English working classes were concerned, occurred in Northamptonshire and Staffordshire, on the occasion of its introduction into the boot and shoe manufacture. Whether Mr. Howe, when engaged in perfecting his remarkable invention, had in view its use in making boots and shoes, is not known, but no sooner did a few of his machines find their way into general use than it was perceived that if certain modifications of construction could be effected, they would be enabled to perform in a most efficient manner several of the more laborious processes in connection with the production of leather and other coverings for the feet. In the United States many thousand pairs of boots and shoes had been made with the assistance of the machine, long before the English manufacturers began to consider whether they should or should not avail themselves of the new mechanical appliance. This hesitation, short-sighted as it may now appear, arose from grave doubts respecting the durability of machine sewing as applied to the production of leather articles. Even when the more enterprising manufacturers perceived the possible advantages arising from the use of the machine, they had to encounter a widely spread prejudice on the part of the general public against the goods produced with its assistance. This led to many machine-made articles being sold as hand-made, besides restricting the use of the sewing machine to the cheaper and inferior descriptions of goods; so that the actual advantages, in the shape of improved workmanship and improved finish, arising from the employment of the machine, were primarily enjoyed by the poorer classes of the community. Several places claim the credit of being the first in which the sewing machine was introduced into the boot and shoe manufacture, but there can be no question that the production of machine-made boots and shoes on a large sale commenced at Leicester, the results proving so successful and encouraging that the example of the Leicester Crispins began to be emulated at Kendal, Leeds, Norwich, and elsewhere, until at last a few of the manufacturers at Northampton and Stafford, which had been for many generations the principal seats of the boot and shoe trade, became alarmed lest their industrial supremacy should be endangered, and determined, at the risk of offending their workpeople, to introduce the machine into their establishments. In November, 1857, the shoemakers of Northampton became acquainted with the fact that a sewing machine had been brought to the establishment of one of their employers. "Alarm and excitement," says Mr. John Ball, "rapidly spread amongst the operatives. An open-air meeting was convened; it was attended by large numbers who believed, in the language of one of the speakers, that ruin was impending over all branches of the trade; that many would at once be thrown out of employment, and that the earnings of the remainder would be lowered by their competition." Other meetings followed, and so formidable appeared the opposition of the operatives that the employers, with two or three exceptions, hesitated in their intention. The anti-sewing-

machine agitation continued for several months, meetings being held in all the towns and villages in the county in which the shoemaking trade was carried on; and delegates were sent to Stafford, where a similar feeling of disquiet prevailed amongst the operatives. In April, 1858, the agitation culminated in the formation of a "Mutual Protection Society" for the purpose, as stated in the rules, of preventing the introduction of machinery into the trade, and in order to protect, raise, and equalise wages as far as possible. The majority of Northamptonshire operatives enrolled themselves as members of the new association, which had branches in all parts of the county; nevertheless, the use of the machines continued steadily increasing, and at last, in February, 1859, the manufacturers of Northampton and Stafford came to a mutual understanding, the result being the publication of a formal notice, in which it was stated that in consequence of sewing machines being extensively used in other towns, any further delay in introducing them would be fatal to the trade interests of Northampton, and that it had been determined to use machine-made "uppers" in the principal manufacturing establishments in the town. Furthermore, it was announced that in the event of a strike taking place, none of the Northampton operatives would be employed at Stafford, the only place, with the exception of Northampton, in which the sewing machine had not become systematically employed in making boots and shoes. The strike which followed was virtually a failure. About fifteen operatives left the town in search of work elsewhere, but according to Mr. Ball,* "They did not find as much sympathy among the men in their own and other trades in the districts where they appeared as they had been led to expect, especially when it was found that either from necessity, or because they had no strong feeling on the subject, men who had struck against machine shops in their own town, consented to make up machine-prepared work elsewhere. The result was that most of them returned before long to Northampton, where in many cases they found their places filled up by strangers who had come in from neighbouring places, and much distress necessarily ensued." Mr. Ball does not mention, however, one circumstance which considerably weakened the case of the anti-machinists, namely, that while opposing the use of the sewing machine in their own trade, they permitted their wives, sisters, and daughters to work it in the stay, clothing, and other manufactures.

With the termination of the strike there became manifest, on the part of the operatives, an intense eagerness to possess machines of their own; and, before many months had elapsed, there were few of the better class of workmen who were not proprietors of one machine or more. These were worked either by the female members of the family or by young women engaged specially for the purpose. Previously the heavier kinds of "uppers"—those required for men's boots and shoes—were made

* Report of Social Science Association Committee on Trade Societies, 1860.

principally by male operatives, the females being chiefly employed on the lighter descriptions and in shoe-binding. The process of sewing the "uppers" was termed "stabbing," from which circumstance the sewing machine was first known in the trade as the "stabbing machine." The stabbing was laborious, required great attention, and was even dangerous, for the workers often sat so close to each other that, in drawing the thread with both hands, the awl, which was always held point outwards in the right hand, not unfrequently struck the next worker, sometimes a mere lad, in the face or eye, occasioning permanent injury to the sight. The machines belonging to the employers were generally worked on their own premises, thus enabling the whole of the processes connected with the production of the uppers to be conducted under the personal supervision of the employer or his manager. This was the commencement of that remarkable development of the factory system which now forms one of the principal features of the English boot and shoe manufacture. The economy of time and labour thus effected was very large. Instead of the female operative losing a considerable portion of her time in passing to and from the workshop and the place where she resided, to say nothing of the still greater waste of time while waiting for the materials to be worked up, she at once proceeded into the machine room, where she found everything prepared for her. Even where the work was done by machines at home the saving of time and labour was considerable, the operatives no longer having to neglect many of their domestic and other duties lest their task should not be punctually executed. So apparent were the advantages conferred by the possession of the sewing machine, that not a few of the workmen conceived the idea of having workshops of their own, in which they made up large quantities of uppers* for the great wholesale houses. As their business operations became extended, they increased the number of machines at their disposal, and at last exchanged the position of middlemen for that of manufacturers on their own account. It is estimated that at least one-half of the Northamptonshire employers were originally operatives. In Kettering, Wellingborough, and other places, the proportion of labourers who have become capitalists is even larger.

Contrary to the predictions of the anti-machinists, the introduction of machinery into the boot and shoe manufacture did not have the effect of reducing wages or diminishing the demand for labour. On the contrary, the demand for machine-made goods appeared to keep pace with the supply. The small workshops and warehouses with which the employers were previously content disappeared, and in their place rose large and commodious factories, fitted with all the latest mechanical inventions and improvements, yet all this time the trade was developing itself still more rapidly in other parts of the kingdom, and actually assuming in two or three places, such as Leicester, the propor-

* The "upper" is that portion of the boot or shoe attached to the sole.

tions of a staple industry. In 1800 there were not more than twenty or thirty operative shoemakers in Leicester. In 1820 the number was 150; in 1841 it had increased to 746, a portion of whom were females; and in 1851 the figures had risen to 1,375. Then came the introduction of the sewing machine, the effects of which, assisted by the short-sighted policy of the Northamptonshire and Staffordshire Crispins, were revealed by the census of 1861, which showed that, of the operative population of the town, no less than 2,315 were engaged in shoemaking. In 1871 the increase was still more marked, the number having risen to 5,103. This increase, it must be remembered, does not represent any actual transfer of business from other localities, although there can be no question that, if the use of the machine in Northamptonshire had not been impeded by the restrictive action of the local trades union, that county would have beheld a sudden development of manufacturing enterprise, paralleled only by that of the cotton and woollen industries of Lancashire and Yorkshire. As it is, the production of boots and shoes has become spread over a large area, instead of being confined to a few localities.

The influence of these changes on the industrial and social character of the operatives has been of a very marked character. The factory system has been introduced to an extent sufficient to secure its fullest advantages without incurring the possibility of those abuses which have caused it to be regarded with such disfavour by the bulk of our working population. The factories are, as a rule, light, commodious, and well ventilated; every precaution being adopted to secure the proper separation of the sexes. The hours of labour are not too long, nor is the work of an extremely fatiguing nature. Formerly the operatives would work only when they pleased; and in Northamptonshire and Staffordshire the employers suffered much from the irregularity of labour, especially from the practice of keeping Monday as a holiday in addition to the Saturday afternoon.* In the factories this system is not allowed, consequently there is less intemperance and greater regularity of habit, the workers becoming accustomed, as it were, to industrial discipline. The change has been attended with considerable advantages as regards the physical and social condition of the people, there being a remarkable concurrence of opinion respecting the improved health of the operatives and the increased indications of comfort and general well-being observable in their homes. In fact, the whole industrial and social surroundings of our shoemaking population, both male and female, have become completely revolutionised, the change being decidedly for the better.†

* Before the introduction of the sewing machine, it was common in many places, chiefly in small towns, to make holidays of Monday and Tuesday, the four following days being devoted to doing the work which should have been spread over the six. In other words, the life of the workers was one of alternate idleness and excessive toil.

† "Since the introduction of sewing machines," said a small employer, "there has been a great improvement, both in the appearance and the manners of the girls; they are less rough, and have greater self-respect."

Whether employed at home or in the factory, the earnings of the machinists are considerably in excess of those formerly obtained by the hand-workers, even during the most prosperous seasons. Twenty-five years ago the average amount of wages obtainable by an experienced female operator was from 8*s.* to 10*s.* Occasionally a few extremely expert hands would obtain 12*s.*, but they formed the exception, not the rule. The earnings of the machine-worker average from 14*s.* to 16*s.*, the slower hands earning about 10*s.*, and those employed on the best kinds of work from 20*s.* to 24*s.* Nor are those workwomen who are unable to learn the proper use of the machine losers by the good fortune which has attended their sisters. They find ample employment in preparing the work for the machines, their wages averaging about 10*s.* per week. Generally speaking, the introduction of machinery into a trade is attended with much suffering on the part of the workpeople, who find themselves suddenly deprived of the means of obtaining bread for their families. Of course, the period of privation and distress is rarely of long duration, but while it lasts the feelings of the unemployed are often of a most bitter and violent character. The use of the sewing machine was not attended by any of these unpleasant features. From first to last it has proved instrumental in furnishing employment to considerably larger numbers than was possible before hand labour was superseded. There exists no branch of manufacturing industry in which other results have arisen from the use of the sewing machine, but there are several which owe their revived prosperity to its introduction. Among these is the straw hat and bonnet making industry of Bedfordshire. Three or four years ago this important trade was in a most depressed condition, thousands of workpeople being unable to obtain remunerative occupation. This was partly the result of a capricious change in fashionable taste, and partly owing to foreign competition, the Chinese being enabled to manufacture vast quantities of straw plait, which they sold to the Bedfordshire employers at less than one quarter the price given to the English plaiters. This keen competition on the part of the Chinese appeared destined to annihilate the Bedfordshire manufacture, but the sewing machine came to the rescue, and enabled the Chinese article to be worked up into hats and bonnets at such a cheap rate as to lead to their exportation to new markets, thus furnishing fresh means of employment to those who otherwise would have found their occupation nearly gone. At present, the use of the sewing machine in the manufacture of straw hats and bonnets is far from being general; but the unquestionably superior workmanship and cheapness of the machine-made articles must inevitably lead to the substitution of the machine for the hand in every branch of this important industry. This cannot fail to prove of some advantage to the Bedfordshire workers, for many of the plaiters who now suffer from the effects of Chinese competition will be enabled to obtain plentiful and remunerative employment as machinists.

Similar results have characterised the introduction of the machine into other branches of manufacturing industry, there being scarcely an instance in wnich the hand-workers, at least the really skilful portion, have been sufferers by its use. In certain trades, such as that of shirt-making, there is observable a tendency to over-production, occasioned by excessive competition; but under no circumstances can the condition of the workers be regarded as unfavourable compared with what it was when the whole of the needlework was performed by hand. In the Reports of the Children's Employment Commission of 1862, there is a large amount of evidence, showing that, in various trades, the excessive amount of competition among the workers tends to keep down the price of labour; but it does not appear that this tendency has become accelerated by the use of the sewing machine. According to Mr. H. W. Lord, as a rule, wages books in factories, when the hours of work do not exceed ten and a half per day, show hand-workers earning their 6*s.*, 8*s.*, and 12*s.*, and machinists their 9*s.*, 12*s.*, 15*s.*, and 18*s.* per week. In the mantle trade the rate of earnings is sometimes very high. One London employer showed Mr. Lord a wages book, according to which some of the machinists were earning 23*s.*, 29*s.*, and even 33*s.* per week. The middling hands obtained 14*s.* to 20*s.* Those who made the trimmings for the mantles would not accept less than 20*s.* per week. In the stay trade the average wages of the machinists range from 9*s.* to 12*s.* Taking all the various industries in which the machine is used, the wages of the machinists may be roughly estimated as being from 50 to 100 per cent. higher than those formerly received by the hand-workers.

Of the beneficial influence, under proper conditions, of the machines upon the health of the workers, there exists abundant testimony. In the boot and shoe trade it has prevented much of the physical suffering and deformity arising from constant stooping over the "closing" or "stabbing," as the process of sewing the uppers was designated. "Several foremen," says Mr. Lord, "observe that machinists in this trade are more healthy than the shoe-binders of former days were, and attribute it, reasonably enough, to their having more air and exercise, and being able, by means of higher wages, to have better food and dress." These remarks are also applicable to the great body of machinists in other trades. "The machine is much lighter work than hand work," says a Dublin stay manufacturer. "At that girls sit all day, stooping over their work, with one knee up and the work pinned to it, while at the machine they sit quite upright, and get some exercise, and the work is more interesting. They earn more, and at the end of the day are much less tired than hand needle-workers." The opinions of the medical profession are by no means adverse to the machine. In the Sixth Report by the Medical Officer of the Privy Council it is mentioned that Dr. Ord, who had made the subject his special study, was satisfied that the influence of the sewing machine was beneficial

rather than otherwise. Dr. Tripe, Medical Officer of Health for Hackney, found, as the result of careful inquiries, that the machinists looked better and felt better after they became accustomed to the work. Where the results did not accord with the favourable opinions above expressed, it was discovered that the workers were either physically unfit for their employment, or that they followed their occupation in apartments or buildings in which the sanitary arrangements were of the most defective description. In the larger workshops and factories every attention is given to the general health and comfort of the workpeople; but in the smaller establishments the work is frequently carried on under conditions calculated to promote the spread of disease. For example, fifty workpeople will be crowded into a room scarcely sufficient for ten or fifteen, there is no proper provision for light or ventilation, the quantity of gas consumed is excessively large, and the workshops are often used also as living and sleeping rooms. In such instances it is not the sewing machine, but the utter neglect of the simplest sanitary precautions, to which the deteriorated health of the workers is attributable. In many instances the evil is gradually effecting its own cure. A Northampton manufacturer informed Mr. Lord that a friend of his was compelled to erect a new factory because, "as his present workrooms were damp and ill-ventilated, he could not get as good hands as his neighbours." In Londonderry, where the manufacture of shirts and other articles of clothing has within the last few years attained the rank of a staple industry, giving employment to large numbers of young women, several factories of considerable extent have been erected, in which every requisite provision has been made to secure the health of the machinists and other workers. The larger establishments possess accommodation for about 1,000 workers each. In one of these, visited by Mr. J. E. White, the regulations as to the cleanliness and healthfulness of the buildings were found strictly enforced, no person being allowed to remain in the workrooms during mealtimes, and a regular medical attendant being engaged at a salary of £100 per annum. The average rates of wages were low, and not always sufficient to secure the workers the necessary food and dress, but the general health of the machinists was remarkably good. "I consider," says Dr. Bernard, "the care of the sewing machine more healthy than needlework. It gives them more general exercise, and moves the muscles of respiration more, and thus more atmospheric air is introduced into the system." Indeed it may be said that even under the most unfavourable conditions those employed on the sewing machine are far better circumstanced, in nearly every possible respect, than were the thousands of hard-working needlewomen who had to labour from fourteen to eighteen hours per day to obtain a miserable pittance.

It is one of the saddest characteristics of English working-class life that increased income does not always imply increased providence, and to this rule the machinists form no exception.

Their wages are expended principally in food, lodging, and dress, the latter being the most expensive item. This may be "good for trade," but it certainly does not contribute to the social advancement of the workers. As regards children, the use of the machine has checked the demand for their labour, and thus facilitated the efficient working of the Education Act in many places where its provisions would have been found difficult to enforce. In the Second Report of the Childrens' Employment Commission, it is stated that "the introduction of the machine has necessitated the employment, on the whole, of older children and girls, the usual age for commencing being about fourteen." A Northamptonshire shoe manufacturer said, "I think there is little fear of very young children being employed as they used to be in the trade, for they cannot compete with the machines, and by that simple fact are driven out of the market." In many factories and workshops children are still employed, principally in preparing materials for the machinists, but their numbers have become enormously decreased, in several instances the reduction being as much as 95 per cent. Where the workers have endeavoured to economise their increased gains, the results have been of a most beneficial character. In some of the Northamptonshire towns and villages, the possession of a sewing machine has frequently enabled an operative to purchase the cottage in which the family resided; and if habits of temperance and frugality were more prevalent amongst the workers, their social condition would become largely ameliorated.

In many parts of the United Kingdom the sewing machine has been instrumental in providing remunerative occupation to large numbers of unemployed females, especially in Ireland, where many thousands of girls and young women are engaged in the manufacture of stays, shirts, and similar articles, the amount yearly given in wages being variously estimated at from £1,500,000 to £2,500,000. In the English midland counties so extensive has been the demand for female labour that comparatively few girls care to go into domestic service. It may be said, with considerable truth, that the scarcity of female domestic servants which has of late years become so widely felt, is one of the direct results of the introduction of the sewing machine, which, by opening new and apparently inexhaustible channels of employment for our poorer female population, has assisted in checking that excessive competition which, until a comparatively recent period, compelled numbers of working women to accept wages which hardly sufficed for their maintenance. Still more remarkable is the manner in which the ingenuity and inventive tastes of a considerable portion of our artisans and mechanics have become developed, in consequence of the demand for competent persons to undertake the repair of sewing machines. When Mr. Howe's invention was still new to this country, there was scarcely an ordinary mechanic who could be entrusted with the duty of keeping it in proper working order. As the machines

came into general use the want of competent mechanics was severely felt. The whole country was ransacked for suitable men, and when they were found, they could make their own terms. In more than one instance a skilful and ingenious artisan is known to have received as much as £10 in a single week. Here was a temptation for those who possessed a natural aptitude for mechanics. It did more for the advancement of technical education than could have been effected by the establishment of any number of Whitworth Scholarships. Watchmakers, jewellers, gasfitters, plumbers, surgical instrument makers, carpenters, masons, agricultural implement makers, and others, were among the foremost in adapting themselves to the new and profitable calling thus placed within their reach. Perhaps the most characteristic and instructive example of the manner in which the opportunity thus afforded could be utilised by a simple labouring man, was furnished by a Northamptonshire silk-plush weaver, who, devoting his leisure hours to the repair of watches and clocks, found his self-gained knowledge and experience of considerable service when applied to the repair of sewing machines. Such was the skill of the ex-weaver in his new occupation, that his assistance was constantly being sought by the owners of machines, but he was not content with this. He aimed at becoming a manufacturer of sewing machines. During the few hours that he could call his own, he constructed a model of a sewing machine, in which, while carefully avoiding any infringement of existing patents, he introduced numerous improvements suggested by his practical experience. The experiment proved successful. The machine produced by our ex-weaver was cheap, good, and effectually answered the purpose for which it was intended. As its merits became known it found a ready sale, and before many months had elapsed its inventor found all his time and energies required for its manufacture. He persevered, established workshops of his own, and at last found himself the proprietor of a large manufactory, containing plant and machinery valued at several thousands of pounds, employing scores of skilled mechanics, and producing many thousands of sewing machines every year. Truly may it be said, that in the annals of industrial self-help there is to be found no brighter or more encouraging example than that of Owen Robinson, the sewing machine manufacturer of Kettering.

There exist no official statistics relative to the number of sewing machines annually produced in this country, but experienced persons have expressed an opinion that it cannot be less than 70,000 or 80,000, if not much higher. The manufactories are to be found scattered over the country, many being situate in Lancashire, in the neighbourhood of Manchester and Oldham. Even the agricultural county of Essex can boast the possession of a sewing machine works, a significant indication of the remarkable manner in which the new mechanical appliance has sprung into general use. The Scotch machines are made principally, if not exclusively, at Glasgow, and bear an excellent reputation for workmanship and finish,

several specimens displayed at the recent Philadelphia Exhibition having attracted considerable attention in consequence of the almost faultless character of the mechanism. There are no manufactories of sewing machines in Wales or Ireland, although the use of the invention in the latter country affords employment to many thousands of workpeople, chiefly females, thus assisting in diminishing the stream of Celtic emigration to England during the period of the corn harvest. On the Continent there are numerous sewing machine manufacturing establishments, principally, we believe, in France, Belgium, and Germany, those of the latter country finding their way into Russia, the Danubian Principalities, and various parts of European Turkey. The continental machines generally have a tasteful appearance, but are less substantially constructed than those produced by English and American manufacturers, although the various inventions and improvements effected by the latter are unsparingly used, thanks to defects in the Patent Law system, by foreign manufacturers. Yet it is not quite certain that what appears at first sight to be a disadvantage is really such, for the necessity of relying upon superior workmanship to enable them to hold their place in the European market, has prevented English and American manufacturers from falling into the great industrial error of sacrificing excellence and quality to mere cheapness, if an imperfect article sold at a low price can be honestly designated as cheap. Few of the continental manufactured machines find their way out of Europe, but those of England and America have become extensively used in India, and even China, the inhabitants of the latter country exhibiting considerable tact in applying the invention to numerous industrial purposes.

The number of persons engaged in the English sewing machine manufacture is very large, the wages varying according to the amount of skill required. Many of the machines are sent to Birmingham for the purpose of being lacquered and ornamented, but the expense and loss of time thus occasioned is leading to the use of tables with polished metal surfaces. The manufacture of the silk and thread required for the machines constitutes a special branch of industrial production, as does that of the particular descriptions of needles used by the machinists, and which are principally made by the firms that formerly produced the old-fashioned needles for the hand-workers. Altogether there cannot be less than one hundred thousand persons directly or indirectly concerned in the manufacture of sewing machines and the various trades connected therewith. In the United States the number is even larger, while in France and other continental countries it is estimated at about 50,000. Consequently, the invention of the sewing machine has become productive of employment to at least a quarter of a million artisans and others in various parts of the world, exclusive of the enormous number engaged as machinists. And yet the manufacture is still in its infancy. Not the least curious and instructive feature of the sewing machine

manufacturing industry is the manner in which it has assisted in stimulating mechanical ingenuity and invention in other directions, especially in connection with the various important industries in which the machine plays a conspicuous part. In the boot and shoe manufacture, for instance, the number and variety of mechanical appliances recently introduced has become so large, that employers are rapidly becoming perfectly independent of unassisted hand labour, save in the cutting of the leather required for the upper portion of the boot or shoe. In numerous establishments the soles and heels are cut by machinery, generally worked by steam power. In like manner the heels are affixed to the sole, pared, and all but finished; the operation occupying a few minutes only, instead of an hour or two as formerly, and the workmanship being of a better character. In the stay and clothing trades, the shears have become replaced by cutting machines worked as usual by steam, with the aid of which a single skilled operative can perform the ordinary work of about twenty men. But all this has not led to any perceptible displacement of manual labour, the increased demand for the manufactured articles enabling the majority of handworkers to obtain remunerative employment, notwithstanding the enormouly increased rate of production occasioned by the introduction of machinery.

In the English colonies the industrial results of the sewing machine have not been less marked than in the mother country. In Canada it has led to the establishment of clothing manufactories on an extensive scale, which has, however, been surpassed in Australia, where the Melbourne and Sydney boot and shoe makers annually produce, with the assistance of the machine, thousands of boots and shoes from colonial leather. In Victoria alone there were, in 1874, no fewer than forty-two boot and shoe manufactories, six being worked by steam power, containing machinery and plant valued at nearly £15,000, and employing over 1,800 hands; the value of the goods produced during 1874 being estimated at £400,000. In New South Wales the progress of the manufacture has been equally rapid. In every place where the sewing machine has been introduced it has had the double effect of developing existing industries and creating others. In very few instances has it operated prejudicially upon the interests of the operatives, and then only for a very short period.

So apparent, indeed, are the advantages of the new mechanical appliance, that the men who formerly opposed its use have become its warmest friends, and readily admit the mistake into which they fell through their misconception of its real character. In the household the sewing machine has become an almost indispensable appendage, and there are few housewives, even in higher social circles, who do not know something of the management of an apparatus which enables them to avoid much of the drudgery that once made needlework so frequently a laborious task. One result of this silent revolution is that nearly every

article of clothing is made better and more strongly than was the case a few years ago. The standard of excellence in workmanship has been considerably raised, the opportunities of employment are largely increased, the hours of labour reduced, and the earnings of the operatives augmented, by means of an invention which, when first introduced to public notice, was actually described by a leading newspaper as "an ingenious mechanical toy, of little practical use." Elias Howe knew the true character of his invention better than did his critic, and when posterity is asked the names of those whose labours have proved most useful and beneficial to their fellow-creatures, they will include in their answer that of the Inventor of the Sewing Machine.

JOHN PLUMMER.

THE PRINCE OF WALES'S INDIAN PRESENTS AT THE INDIA MUSEUM.

ONE of the most interesting sights of the past season was the unique collection of valuables and curiosities presented to His Royal Highness the Prince of Wales, by the native Princes and Chieftains, in the course of his progress through our Indian Empire.

The custom of offering gifts—either of money or valuables—to the Sovereign Lord, has prevailed in the East from time immemorial; these gifts are known in India as "nuzzer," and are of the nature of a tribute in token of subjection to the paramount Chief. But on the occasion of the Prince's visit to India, the Government published a notification beforehand dispensing with the usual "nuzzer," and the gifts which were made were therefore all purely voluntary, and are consequently the more valuable as tokens of loyalty and attachment. Their political value is also exceedingly great, for when we consider that some of the offerings are heirlooms, either of sovereign families or, as in the case of the famous sword of Sivajee, of a nation, we cannot but acknowledge that nothing but feelings of amity and goodwill to the British Government can have prompted their offering.

Immediately after the return of His Royal Highness to England, it became known that he intended affording the public an opportunity of inspecting the treasures he had collected during his travels, by exhibiting them in the India Museum for a few months, and many were the anxious enquiries which were daily made at the doors of the Museum, between the date of the announcement and that of the Collection being ready for public inspection.

And here a few words as to the India Museum may not be out of place. This Museum was founded in 1798, at the old East India House in Leadenhall Street, for the reception of the

curiosities and treasures which had been presented at various times to the Honourable East India Company; a little later it was decided that the Museum should contain also an adequate representation of the mineral, vegetable, and animal products of India, as well as a complete series of the manufactures of the country. In 1860, the Museum changed its quarters to Fife House, then to the upper floor of the India Office, and finally, in 1874, an arrangement was made with Her Majesty's Commissioners for the 1851 Exhibition, by which the Eastern galleries of the International Exhibition Buildings, at South Kensington, were leased to the Secretary of State for India, for occupation by the India Museum, for three years. The collection had during all this time been progressively growing in bulk, but had always been cramped both in space and in funds, and although the present galleries afford far more superficial space than had ever previously been allotted to the Museum, they are not very well suited to the proper display of the collections. It is earnestly to be hoped that before long the Director, Dr. Forbes Watson, may see the realisation of the scheme at which he has been working for years, and that the India Museum may at length have a home of its own, and not have to wander about in search of lodgings.

The authorities of the India Museum, having no funds to devote to the purchase of the most suitable show-cases and fittings for the effective display of the treasures of Oriental art brought home by His Royal Highness, had to make the best possible use of such cases as were already in the Museum, even though many of them were not at all adapted to the use to which they were now to be put; accordingly, the two northern rooms of the Upper Gallery were denuded of their contents—principally the Museum collection of textile fabrics—and the arrangement of the Prince's collection was at once taken in hand. For many reasons it was found both unadvisable and impracticable to arrange the gifts of each Chieftain or of each State in a separate case; and, in many instances, so heterogeneous were the gifts of any one Chieftain, that it would have been impossible even to arrange them in at all close juxtaposition; so it was decided to assign certain groups of goods to certain cases, and there to arrange them without special reference to their places of origin, and on the same plan it will be advisable to attempt a slight description of them.

On entering the India Museum by the principal entrance from the Exhibition Road, the visitor found himself in a long room where the sculptures from the Amravati Tope were exhibited; these sculptures were discovered by Col. Mackenzie about sixty years ago in and around a ruined "Tope" or commemorative mound on the bank of the river Kistna, in Madras; about thirty years ago, Sir Walter Elliot had this mound explored and excavated, and sent home the series of sculptures which are here exhibited. Mr. James Fergusson, the celebrated authority on Ancient Architecture, has exhaustively described and illustrated these sculptures in his "Tree and Serpent Worship;" he places

the date of the monument at from 400 to 500 A.D. This room also contains some Buddhistic sculptures from the neighbourhood of Peshawur, and Dr. Leitner's collection of Græco-Buddhistic sculptures from Takht-i-bahai, in the extreme north-west of the Punjab; these collections are still in course of arrangement.

On leaving this room and turning to the right, the collection of vegetable products in Room No. 1 on the ground floor would first engage the attention; here are samples of the food-grains, the vegetable oils, the fibres, gums, resins, dye-stuffs, timbers, in a word, the whole of the enormous wealth furnished by the vegetable kingdom throughout our Indian Empire. The collection is supplemented by models of most of the rude agricultural implements in use, and by a beautiful series of photographs of forest and rural scenery. The next room contains models of the various modes of conveyance—both by road and by water—in use throughout India, a few architectural and engineering models, and the Mineralogical collection. This is not so complete as the vegetable product collection, both because fewer samples of minerals have been received, and because there has hitherto not been sufficient space in the Museum for the exhibition of a proper series of the minerals of India; still the Iron Ores, the Coal, and the various Clays and Building Stones are well worthy of inspection.

The next room is devoted to the Museum offices, and we then reach the Zoological department. This also has suffered much in consequence of the lack of room for so many years; this has caused the storing and consequent deterioration of the collection, but it is still a very valuable one; in addition to the stuffed specimens of animals, birds, fishes, and reptiles, there is a large series of animal products, such as wool, furs, feathers, horns, leather, ivory, lac, silk, pearls, &c., and a most useful collection of the insect pests which are so destructive to the growth of forest trees and also of the crops of tea, coffee, and indigo.

After leaving this room the visitor would have completed the inspection of the lower gallery of the Museum, and would then have to ascend the northern staircase which leads directly into the rooms where the Prince of Wales's presents were exhibited.

On first entering the rooms where these treasures were displayed, the visitor would probably feel absolutely dazzled by the splendour of the scene, and it was not until this feeling had time to wear off, and he had leisure to realize that he was not dreaming of a scene from the Arabian Nights, that he was able to settle down to the contemplation of individual objects.

The first cases which would attract his attention were those containing the gold and silver ware; there were vases and plates, and tea services of nearly all the tints which gold and silver may be made to assume, from delicate frosted silver to the ruddy gold of some of the Cashmere work; but though one could not help admiring the beauty of the ornamentation and the form of many of the specimens, yet one was constantly being reminded of the so much talked of degradation of Oriental art by the copying of

the worst European patterns. One of the specimens which showed this in a most marked manner was the solid gold tea service in the first case; it would be difficult to imagine the man or woman who could with pleasure contemplate this execrable set while sipping his or her evening tea, and yet, no doubt, the native artificer, who copied it from some models in a very different material, was proud of his work, and his happiness must have been complete when he finished the set with the two cumbrous tea spoons of the size of ordinary table spoons.

In the same case were two large tazzas or chargers, of gold so pure as almost to bend in consequence of their own weight, but of a very bad European design; also the massive gold "Alexandra" cup, presented by the Maharajah of Mysore; this is of European form, surmounted by an elephant, the shape not very regular, but the chasing well and boldly executed. A most conspicuous object also was a circular tray of fine gold, filled with lotus leaves and flowers in frosted silver, and upon which were mounted a pair of Bison's horns from Calcutta; from the centre sprang a clump of gold bulrushes, having on each side a small flacon with gold top, hollowed out of rock-crystal; each horn was finished off with a cover surmounted by a small red velvet crown; the effect of the whole was decidedly spoilt by this attempt to combine European and Oriental forms.

It was with pleasure that one could turn to some specimens of native design, such as the pair of gold perfume sprinklers in the form of birds from Cutch; these were of rough repoussé work, and were good specimens of Indian art. Even more to be admired were the "surahis," bowls, cups, and trays of pure gold from Cashmere, chased all over with the same delicate tracery that is constantly seen in the shawls from the same country; these were to be distinguished also by the red colour of the gold; this coloured gold comes only from Cashmere aud Burmah; from the latter country come specimens of all possible tints, from a pale straw yellow to a dark brown, the colouring being in all cases produced artificially after the manufacture of the article is completed.

There were also an infinite number of small and elegant objects adapted for holding "uttar," "pan," spices, &c.; cups, plates, and goblets of every possible variety, and all of the purest gold.

Of silver work there was an endless variety, that from Cashmere being above all commendable; indeed, such a collection of tea, coffee, and dessert services, candelabra, wine jugs, goblets, and trays, all of the same beautiful work, has never before been brought together in Europe.

In this ware, the whole surface of the article to be ornamented is first gilded; the design is then traced on with a sharp-pointed instrument, and the ground work is then cut away; when finished, the effect of the delicate gold tracery on the dull silver ground is extremely elegant, especially when combined with the perfect forms for which this ware is justly celebrated. A class of work somewhat resembling this comes to us also from Lucknow,

and in very small quantities from Tonk, but both of these are very inferior in style of ornamentation to the Cashmere work; they are not nearly so deeply chased, the shawl patterns are never used in them, and gold is used but sparingly, generally in the form of one or two gilt borders surrounding the objects, the remainder being of bright silver on a dull ground.

Dr. Birdwood, of the India Museum, is of opinion that this art was imported by the Moguls, and has been improved on in consequence of the great superiority of the Cashmerians over all other Orientals in the application of decorative designs, whether to metal-work, wood, or textile fabrics.

Among the objects which filled three cases with specimens of this work, there were so many worthy of remark that it was difficult to select any piece as being better than its fellows; the massive pair of candelabra, and the set of dessert dishes, were remarkable for their size, every inch of their surfaces being as scrupulously covered with elaborate designs as was the case in the smaller articles; for beauty of form, however, the smaller objects, such as coffee and tea services, "surahis" or goblets, claret jugs, cups, and trays, were more to be admired.

Perhaps next to the Cashmere work the repoussé or hammered silver from Cutch would be the most striking; there were several specimens, such as goblets, trays, and rose-water bottles, of this work, and one very large and massive centre-piece for a dessert table, which was not remarkable for beauty of form; it consisted of a very large pineapple-shaped body supporting a flower vase, the whole on four dragon-shaped feet; the pineapple body was capable of being opened longitudinally, and it then displayed a silver liqueur bottle, with a set of glasses.

From Madras came a very massive silver tea service in a cabinet; in this, the cups, saucers, and spoons were good, and of native design, but the teapot, and more especially the tea-trays, were completely spoiled by the incongruous introduction of the Prince of Wales's Plumes and the Arms of England in the midst of the native designs known as "swami" work.

Another present from Madras was a cabinet containing a complete set of dessert knives, forks, and spoons, fish knives, &c.; these were of good workmanship, and the ornamentation was exceedingly elegant.

Other objects worthy of notice were a silver bottle-stand, from Bikanir, made in the form of three camels' necks, the bottle itself being furnished with a neck in the form of a fish, the fish in this case being curiously enough represented as swallowing a camel; a large silver rose-water fountain, from Cutch; and a most extraordinary and ugly tea service from the same place, made in the form of a tree, having brackets instead of branches, each bracket supporting a teapot, milk-jug, sugar-basin, or egg-cup, the teapots in the form of birds.

In the whole collection there was nothing more beautiful than the enamelled gold work from Jeypore; all the specimens were of massive and pure gold, exquisitely enamelled in the most brilliant colours, red, green, blue, and white, and many pieces were also richly jewelled.

Perhaps the gem of the whole collection was a small "kalamdan," or pen and ink case; this was a most beautiful and original piece of work, being made in the shape of a native boat, with the head and breast of a peacock forming the raised stern; every detail complete, the canopied awning, the oars, and the tiny grapnel-shaped anchor, all gracefully enamelled, and the peacock's head and breast further ornamented with jewels. It is a model of the boat belonging to the Maharajah of Benares in which H.R.H. The Duke of Edinburgh crossed the Ganges in 1870.

Scarcely less beautiful than the preceding was an elegantly shaped "Utter-dan," of the purest gold, entirely covered with enamelled decoration of the most exquisite design, surmounted by a flower bud which opened in order to contain the scent; this was decorated with many rose diamonds, and supported on jewelled feet, and fringed all round with about three hundred faultless Indian pearls. Other lovely specimens were a cup and saucer, a salver thirteen inches in diameter, a scent-vase, and a snuff-box, all richly covered in the same superb style of enamelling, and most of them further ornamented with jewels. Hung in the same case was a set of horse-trappings of pure gold, decorated with beautiful red and white enamel of faultless design, a court sword with the hilt and scabbard mounts decorated in the same style, and two pairs of "chowries" or fly-flappers, the handles of which were superbly decorated with gems and enamelling.

There were also specimens of enamelling from Cashmere and Kangra; the designs were the same as those described as used in the silver and gold work, but the engraved lines were filled in with green and blue enamel.

Not far from the enamel case was a case full of curious and interesting Hookahs, the centre specimen being made of pure gold, entirely covered with Jeypore enamel, and profusely decorated with diamonds, emeralds, and rubies; the snake was covered with gold, and the hookah stood on a velvet mat richly embroidered with gold.

Near at hand were some samples of delicate carving in cocoa-nut shell; some of the shells were mounted with silver rims and feet, and made most elegant vases.

But of all the groups, the most attractive was the large central case of arms, together with the smaller cases clustered around it; the collection of arms was undoubtedly the most remarkable and complete which has ever been exhibited either in Europe or in India; it contained specimens of all forms, of all makes, and of all periods, and from all districts, ranging from Cashmere to Ceylon, and from Persia to Singapore.

Of Armour, the first and most striking object was a suit (Coat of mail and Helmet) made entirely of the scales of the Pangolin (*Manis Pentadactyla*); each scale was ornamented with gilding and studded with turquoises and garnets. Suits of chain-mail, both fine and coarse, and helmets and breastplates

of the finest damascened steel were also well represented. The art of damascening, as applied to arms and armour, has been long and successfully practised in India, though it is to be feared that it will to a great extent die out now that the manufacture of arms has so nearly ceased; the same process is at present, however, applied (mainly at Sealkote) to the decoration of caskets, salvers, and other small articles. This work is known as "kuftgari," and is produced by engraving the desired pattern on the piece to be ornamented, and then hammering fine gold wire into the graven lines; the piece is then burnished up, and in many cases "blued." Several very fine specimens of shields thus ornamented were contained in the collection. Other shields there were of various materials and styles of ornamentation; one in particular was sure to catch the eye, being of silver gilt, and covered with fine old Jeypore enamel, while countless large flat diamonds glittered from every available inch of the surface; another was thickly studded with seed pearls; a third appeared to be entirely composed of small red garnets, so closely were these placed together; a fourth was lacquered with most exquisite designs of flowers, having four central bosses made of jade and jewelled. These bosses are generally to be observed in Indian shields, and in one specimen they were ingeniously utilised for the purpose of converting a piece of defensive armour into a weapon of offence, each boss serving to mask a pistol barrel, the locks being on the inner side of the shield, whence the pistols might readily be fired at an unsuspecting adversary. There were also shields of rhinoceros hide mounted with gold or silver, from Sylhet; these are greatly valued in India, as it is supposed that they are capable of turning aside a rifle bullet.

Of guns and matchlocks there was a rare assortment; the barrels of many of them were excellent examples of damascening, and the stocks were in some cases fine illustrations of the decoration which Oriental nations are fond of lavishing on their arms. The stock of one matchlock from Persia was ornamented with figures of animals, carved in high relief out of ivory, on a dark brown background; another, from the North-West Provinces, was richly decorated with floral ornaments in lacquer, and several others were liberally adorned with enamelling and with pure gold mountings.

One other specimen must be mentioned, on account of the attention which it was sure to attract, though not on account of its beauty; this was a single-barrelled rifle of English pattern, completely covered, both stock and barrel, with plates of burnished gold, the stock further ornamented with three large stars of diamonds on each side. One of the daily papers, when describing this rifle some time ago, considered that "so splendid a present almost deserved a case to itself;" so it did, as an example of ingenious labour devoted to a bad cause, for even if any game were to come within range of such a weapon, the sportsman who was condemned to use it would infallibly be dazzled by the brilliancy of his own barrel, and be unable to take proper aim.

The swords were conspicuous alike for the richness of their decoration, the beauty of their blades, and their varied and, in some cases, uncommon forms.

The sword of Sivajee, the founder of the Mahratta Empire, deserves first mention, not on account of its beauty, for it was but a long straight blade, devoid of all ornament, with an almost plain hilt, but on account of the manner in which it has been religiously guarded as a sacred relic for the last 200 years at Kolapoor. The other swords are of all shapes and kinds, many of them and of the daggers of such curious shapes as could only have been devised by barbarous nations anxious to cause torture by the incurable wounds they inflicted. There were blades with serrated edges, and with bifurcated points, straight and curved blades, and one at least with a hollow longitudinal groove cut through the blade for a great portion of its length; in this groove small pearls or shot, as in this example, are generally inserted, and these run freely from end to end of the groove when the blade is moved. Others were conspicuous either for the excessive breadth and weight of the blade, rendering them suitable for executioners' weapons, or, on the other hand, for the extreme slenderness and grace of their form, making them appear more like dainty toys than weapons adapted for warfare; there were blades of the finest watered steel, and others richly embossed or ornamented with figures carved in relief. But though the blades were in many cases admirable, it was but natural that the hilts, the scabbard mounts, the scabbards themselves, and the sword belts should attract more attention, at any rate from ordinary visitors, for all Orientals are fond of lavishly using for these details of their accoutrements all the decorative materials at their command. And these materials are by no means wanting in variety, for they embrace gold and silver, diamonds, rubies, emeralds, and pearls, besides the finest enamelling, to say nothing of brightly coloured velvets rich with gold or silver embroidery.

One sword had both hilt and scabbard mounted in gold and richly jewelled, while in the clasp of the belt glittered a diamond of the size of a large hazel nut; another had both scabbard and belt thickly embroidered with seed pearls; while many had richly enamelled hilts, or were studded with quantities of precious stones.

It must, however, be remarked that these swords and scabbards are in most cases not so intrinsically valuable as might be supposed, because the jewels are not of such pure water nor have they the depth that stones used by European jewellers possess. The diamonds are, in most cases, the thinnest possible flakes, and these, as well as other stones, are frequently backed up with foil; the large rubies and emeralds which are used as pendants are generally full of flaws and very bad in colour, but still they glitter and are more effective when introduced in the liberal manner to be seen in these arms than finely cut and polished gems of European workmanship would

be, unless these latter were employed in immense profusion. The daggers were no less remarkable than the swords, whether for their blades or for their hilts and scabbards.

The three principal forms of daggers in use throughout northern India, and frequently met with in the south, are the "Kutar," the "Bichwa," and the "Peshkubz;" the last-named is the simplest form, consisting of a long tapering blade, usually only slightly curved, often quite straight; the handle resembles a short knife-handle, and is made of ivory, horn, jade, or other material.

The other two kinds named above are somewhat more complicated; the "Kutar" has a blade which is exceedingly broad at the base in proportion to its length (the breadth being frequently nearly equal to one-half of the length); it is double-edged, with perfectly straight edges; it is peculiar in having no "tang" for insertion into a hilt, but the blade is terminated abruptly by a straight or nearly straight bar; from the ends of this bar spring two parallel side-pieces, which reach well above the wrist when the dagger is grasped; the fingers are clenched round two other metal bars, which serve also to strengthen and steady the side bars or guards.

The "Bichwa" consists of a waved blade, sometimes furnished with a hilt not unlike that of a common hunting knife, and sometimes with a hilt formed like a broad flat iron loop, through which the fingers of the hand can be passed; in the latter case it is not unfrequently used in combination with, and in the same hand as a sword, of which it forms, as it were, a prolongation downwards, which can be effectively used at close quarters.

Both the "Kutar" and the "Bichwa" frequently have their blades divided from the point nearly to the hilt into two or more parts, with a view to inflicting a more dangerous wound; one variety of "Kutar" has its blade single when used for striking, but when being withdrawn from a wound a spring is pressed, which causes the blade to separate into five parts; another variety is furnished with a pair of pistols, one on each side of the blade. Specimens of all these and of other forms of daggers were to be found in this collection, some of the blades being finely watered, and others handsomely damascened; some of the broader blades giving room for bold representations in relief of animals, hunting scenes, &c. The hilts and scabbards, as was remarked with the swords, were ornamented most profusely; the hilts, when of metal, richly chased, embossed, or damascened; and when of jade or rock-crystal, plentifully ornamented with precious stones; the scabbards either of velvet, or of gold or silver, and in either case their splendour enhanced by the use of pearls and precious stones.

Among miscellaneous weapons, such as spears, battle-axes, bows, &c., there were also many remarkable specimens, some of the battle-axes more especially being worthy of notice on account of the ingenious cruelty of their forms.

The collection of jewellery was not very large, but was extremely interesting as showing specimens of the jeweller's art from all parts of India. It is true that many of the forms are not readily adaptable for European use; but they are generally graceful, and one of their great merits is shown in the happy and economical arrangement of colour and design, and in these respects they may well serve as models to our European jewellers. Many of the pieces are ornamented with gems of enormous size; but these, apart from their beautiful adaptation, are not in most cases distinguished by their great purity or commercial value. Still, some of the pearls were beautiful specimens, notably four unmounted pearls, which were contained in a small black tray; these were of great purity, and perfect in form. Many other fine pearls could have been selected from particular pieces of jewellery, but they were generally mixed up with others which were deficient both in shape and colour. The diamonds were, as a rule, of the thin flat kind used so largely in the decoration of the arms, and the rubies and emeralds had generally many flaws in them. Some of the emeralds were, however, most elaborately engraved all over the face, in a style which would, probably, not be considered to improve the appearance of European jewellery, but is highly valued among the Hindoos. But, in India, precious stones are employed in jewellery in a very different manner to that in which we use them; we, by skilful cutting and polishing, cause even the smallest gems to catch and throw back every ray of light which falls on them, while the Hindoos use their gems simply as patches of bright colour, which work in harmoniously into the general design, and often think more of the size of the gem than they do of its brilliancy.

Perhaps the most elegant piece of jewellery in the collection was a hair-comb, made up of rows of pure and well-formed pearls and of small diamonds, set in enamel. Another fine piece was a turban ornament, consisting of a combination of pearls, rubies, and diamonds, the pearls especially being both large and lustrous.

Scindia presented a huge necklet, which is valuable both intrinsically, and also from the fact that it has been an heirloom in his family for many years; it is composed of eight or ten ropes of pearls, tied together at intervals of every few inches; at each of these points is inserted a large gold bead studded with diamonds set in green enamel; the whole chain is long enough to reach below a man's waist. From Pertabgurh came some of the curious gold and enamel work for which that place is famous, and which is applied to necklaces, bracelets, and brooches; the pieces are generally in the form of rectangular plaques set in plain gold; the groundwork is usually a bright translucent green enamel, with designs of animals, mythological figures, or trees most delicately inlaid in fine gold; these plaques are linked together by short gold chains when required to form necklaces or bracelets. From Rutlam there were some specimens of somewhat similar work on red and blue enamel, including a belt composed of plaques of the red enamel, with

inscriptions in English and portraits, all worked in gold; but the workmanship was not nearly so good, nor were the designs so delicately fine, as in the specimens which are usually received from Pertabgurh.

The rings, necklaces, earrings, and bracelets, were all more or less worthy of notice, some for the huge size of the precious stones which were set in them, and some for their graceful Oriental forms.

Side by side with these jewels belonging to the Prince, were some which were lent for exhibition by Her Royal Highness the Princess of Wales; among these were a golden girdle from Mysore, thickly studded with diamonds, emeralds, and rubies, a necklace of very pure and perfect pearls from Baroda, with a pendant of diamonds and emeralds, the centre emerald of great size, but very thin, and engraved all over the surface, and some very interesting jewellery from Ceylon, of gold filigree, which, in some pieces, was used in combination with tortoiseshell and pearls.

Among the metal work in the neighbouring cases, the most noticeable were the specimens of "Bederi" or "Bidri-ware," so called because the best examples are made at Beder, in the Nizam's territory. This ware is distinguished by having a black ground ornamented with designs in silver; it is principally used for vases, water-goblets, betel-nut boxes and trays, plates, hookah bottoms, &c. The metal of which the black ground is formed is an alloy of copper, lead, tin, and zinc; this alloy is run into moulds of the required form; the ornamental patterns are then engraved deeply on the surface, after which the lines of the pattern are filled with thin plates of silver, which are driven in by means of punches. The whole surface is then smoothed and polished, and the groundwork is stained black, thus contrasting well with the bright silver designs. Specimens of this ware, of most elegant forms, have frequently been sent from India, but the samples in the Prince's collection were by no means to be admired for their forms; the most conspicuous objects were a complete toilet set, evidently moulded from a very common crockery set, and some large flower vases of a common Italian pattern. The details of the ornamentation were good, but such fine work seemed strangely misapplied to these clumsy and common forms.

Of the famous "Kuftgari" work, or steel damascened with gold, there was, with the exception of the arms, but one example; this was in the form of a pillar surmounted by a ball, and with a scroll winding from top to bottom, bearing a few English words; there was, therefore, nothing Oriental in this specimen. But in the same case and in the adjoining one were some vases and plates which were more pleasant to look at; some of these were of copper, with bold and characteristic designs formed by overlaying patterns in silver on them; these were mostly made at Tanjore. Others, made in North Arcot, were of brass inlaid with designs in copper and silver; one circular tray of this

sort had a nondescript, gorilla-like animal seated in the centre; around him, at a little distance, a circle of birds, and around them again an outer circle of animals; the figures being all in copper, interspersed with leaves and other ornaments in silver on a brass ground, stood out in relief, and were very effective. There were also some very quaint and spirited little figures of soldiers and others mounted on horses, camels, and elephants; these were from Vizagapatam.

Of the cases of saddlery, there is little to say except that they were, as is usual with Indian saddlery, brilliant in colour, and gorgeous with gold embroidery.

Of textile fabrics there were four cases, viz., one of "Kincobs" and similar stuffs, in which gold and silver thread are interwoven with silk; one of gold embroideries; one of Cashmere shawls, and one of muslins and other cotton goods. Among the "Kincobs"—the best of which are manufactured at Ahmedabad and Benares—was one especially beautiful specimen, which was sent from Baroda as a present to the Princess of Wales; it had a most pleasing pattern of coloured crossbars on a gold ground, with a border of brightly plumaged peacocks and flowers, and broad ends of plain gold; there was also a very pleasing "Kincob" with a white ground, covered with narrow meandering bands of green in two shades, and dotted over with golden stars. But beyond these the specimens were not very remarkable, except as showing the great increase in the use of the aniline dyes, scarcely a single piece being free from them. In one large specimen, however—a "Kincob" carpet from Hutwa—might be noticed a very pleasing use of one of these colours; the entire groundwork was of magenta-coloured silk, but this was so completely covered by a small diaper pattern in gold, that the rays of bright colour, glancing across the closely placed bars of gold, gave the whole piece the appearance of a very rich "shot" silk; the carpet was completed by a border of heavy gold embroidery and a bullion fringe. These "Kincobs," however, are not the only fabrics in which gold and silver are used; pieces of "Soneree," or cloth of gold, and "Rooperee," or cloth of silver, together with gauzy fabrics of combined gold and silver, sprinkled with flowers of brightly tinted spangles, having almost the appearance of jewels, met the eye on every side, and gave the visitor the impression that he was looking at one of the gorgeous pictures we see in the kaleidoscope.

And, when passing on to the next case in the Museum, this impression was but modified, and not wholly effaced; it was as if the kaleidoscope had received a slight turn, and the picture had changed for one scarcely less brilliant; for here were the famous gold embroideries, table-covers, saddle-cloths, mats, bags, and even dog-cloths, of velvet or silk, blazing with gold and silver embroidery, spangles, and not unfrequently small turquoises and seed pearls. Imagine taking a walk with one's dog dressed in a crimson velvet coat thickly embroidered with gold and pearls! yet here were two such from Rampore; if ever this habit

should be introduced in London, there would be an additional temptation to dog-stealers.

One of the most striking objects in this case was a large black velvet table-cover, with rich gold and silver embroidered border, from Dhurumpur; the handsome appearance of this was, however, completely marred by the central ornament, which consisted of the Prince of Wales's plume, surrounded by the collar of the Star of India, and that again surrounded by a loyal inscription in English; the whole offending the eye by the crookedness of the work. At one end of the case hung a long shawl of a delicate French grey, richly embroidered with gold tracery, the tasteful and harmonious effect of which left nothing to be desired. Directly in front of this hung an object which was sure to attract attention; this was a necklace for an elephant; it was made up of a series of gold embroidered badges or circular ornaments, studded with seed pearls and turquoises, and connected together by short chains made up of links of gold tissue; a larger embroidered badge, with fringe of green glass drops, resembling emeralds, completes the ornament, and the whole is not unlike some Mayor's chain. Necklaces resembling this in form and material, though of smaller dimensions, are also used in some parts of India when State receptions or entertainments are given by the native princes; one of these garlands is then thrown round the neck of each guest as he arrives, the richness of the garland being proportioned to the importance of the guest.

Specimens of the table-covers which are so handsomely embroidered in Cutch were also to be seen here; the groundwork is generally of black cloth, and a pattern of flowers and leaves is so thickly worked on in coloured silks as to leave only a little of the black ground visible; the effect is, however, but too often marred by the excessive brilliance of the aniline dyes which are usually plentifully employed in them.

This case was filled up with scarves and turbans of many bright tints of muslin and gauze, in which broad stripes of gold or silver were generally interwoven; caps, slippers, and belts, all liberally covered with gold spangles, were strewn about in profusion.

Passing round the large central arms-case the Cashmere shawls and muslins came in view.

The taste for Cashmere shawls is not now nearly so great in this country as it was some years ago, but still many ladies must have longed to possess some of the beautiful specimens exhibited here; these varied from pieces of the plain "pashmina" cloth, which is made from the wool of the shawl-goat of Thibet, and on which the finest hand-embroidered shawls are afterwards worked, to neckties, scarves, and shawls of various colours, and both hand-worked and loom-woven.

The shawl which perhaps attracted the most attention, on account of its peculiarity, was one which was a complete map of the city of Sirinagar, the capital of Cashmere. This map, though it must not be considered to be as correct as one of our Ordnance Survey

maps, contains a host of houses, temples, and streets, with the inhabitants walking about or standing at their doors; on the deep blue river are represented many boats with various kinds of fish swimming calmly along towards the anglers who are waiting to catch them. Close by this shawl was another which, on account of the soberness of the colours, scarcely attracted so much notice as the preceding, and yet was even more worthy of attention; it was positively one series of small and delicately embroidered pictures of men and animals, birds and flowers.

Of muslins there was a rich store; with the exception of some of those from Benares, which are spotted with gold on a ground of white, black, brown, or purple, the muslins do not attract the eye by their brilliancy so much as by their exceeding fineness; those from Dacca have for years been noted above all others for this quality; one kind, known as "Mulmul Khas" or "King's Muslin," is so fine that a piece of it many yards in length and a yard in width can be passed through an ordinary finger ring.

The collection of native-made lace from Tinnevelly and Travancore must not be passed by without mention; there were many specimens of great merit, including some which were worked in gold and silver thread.

From Nepaul, and also from Dera Ismail Khan, in the Punjab, came some very charming fur-lined jackets of silk, in some cases trimmed and slightly embroidered with gold braid; although their cut might not quite meet with approval in Europe, yet they were far more tasteful in general design that most of the fur-lined cloaks and jackets one sees worn by the ladies of Vienna and Berlin. At the end of the first room were two objects which were sure to attract attention, the first a large elephant-howdah in which the Prince rode as he entered the city of Jeypore; the sides and framework are covered with plates of silver-gilt, and the dome-shaped roof is covered with richly embroidered cloth of gold; the second, a bed presented by the Maharajah of Cashmere, which was almost universally admired; it is a four-post bedstead, the posts and legs very slender, and entirely of the Cashmere silver work previously referred to, with white frosted ground and the raised designs gilt; the top and curtains of yellow, embroidered with needlework, and the linings of a dull red; the bottom of the bedstead made of the broad cotton tape almost invariably employed for the purpose throughout India.

In the next room was another bedstead from Travancore; this was entirely made of ivory, the head and foot rails of Hindu design, though the legs and feet were of the ordinary lion's foot pattern so frequently seen in Europe; this bedstead had a low top to it, worked into panels in the interior, and covered with gold brocade.

Close by was a palanquin from Vizianagram, which was marvellous as a piece of workmanship, but was not so pleasing on close inspection, because there was absolutely nothing Oriental about it but the form; the panels were of ebony covered with ivory fretwork, the ivory itself engraved with flowers in black;

this work is very well known in connection with the quantities of writing-desks, work-boxes, and stationery-cases which have been sent over to the various recent International Exhibitions; these goods were nearly always unsaleable, partly from the high prices, but more in consequence of the work and designs being purely of European introduction. The palanquin was fitted up with cushions and pillows covered with Kincob, the lamps were of silver, but copied from common carriage lamps, and the poles by which the palanquin would be borne on men's shoulders were finished with heavy ends of solid gold.

The people of Madura presented the Prince with a silver throne, which was also conspicuous here; the silver work of both throne and footstool was good in design, though somewhat rough in execution, but the effect of the whole was ruined by the bright magenta-coloured damask which was used for the upholstery.

Nearly opposite the Madura throne was a case filled with specimens of most of the principal kinds of lacquered work which are manufactured in India; at the top of the case were numerous samples of boxes and bowls (some of large size) made of bamboo, lacquered and painted all over with intricate designs. These are manufactured in Burmah, where they command very high prices, though the work does not appear to be held in very high estimation in Europe, if we may judge by the specimens which have been sent over to most of the International Exhibitions of late years, and which have been found quite unsaleable owing to their high prices. From Kurnool there were large trays lacquered in relief with conventional flowers and leaves in bright colours and gold, on a ground of white, red, or gold, and from Dera Ismail Khan came boxes and other specimens of turnery lacquered with great skill and elegance, and further ornamented with delicately turned and carved bosses of ivory.

Here were again more proofs of the skill of the inhabitants of the Cashmere valley in the shape of boxes, trays, and inkstands of painted papier-mâché; this work is deservedly prized both in India and in Europe, on account of the extreme elegance of the ornamentation. The articles themselves are made of papier-mâché, which is covered either with a thin coating of white plaster or with white paint, and on this groundwork the most elaborate patterns are painted in bright colours, after which the whole is varnished. In the case of large pieces of work, the articles are generally made of wood, the process of ornamentation being the same as that described above. The patterns used are generally the common shawl patterns, but sometimes flowers, principally roses, are freely introduced, especially in borders.

In the same case were specimens of the handsome boxes made at Sawunt Waree, from Kuskhus grass, richly ornamented with gold embroidery and beetle wings.

Near at hand was a case containing boxes, desks, and album-covers in carved sandal-wood, ivory, and Bombay inlaid work.

There were no very remarkable specimens of inlaying, but some of the sandal-wood carving was good; there was one colossal album, with its covers made up of panels carved with mythological subjects, and further decorated with chased silver bosses. There was also a box from Vizagapatam, which was ornamented on the top with a large piece of ivory fretted and carved in relief, with a representation of a lion hunt and other similar scenes; the box itself was merely veneered with ivory, decorated with the same floral borders in black as were employed in the palanquin from the same place. In the centre of this room was a case filled mainly with architectural models carved in wood, ivory, and pith; of the latter substance, there were several beautiful and large models of temples from Tanjore, so finely executed and so white that they were generally considered to be of ivory.

An ivory model of the river front of the Ramnuggur Palace, constructed for use as a cabinet, was very well made.

Here was also an interesting model of one of the "Towers of Silence," which are used by the Parsees, one cannot say for the purpose of burying, but as a place of rest for, their dead. As no one but a Parsee is ever allowed to enter one of these structures, the accounts hitherto received of them were inaccurate; they have been described as towers with their tops covered with an iron grating, on which the dead were laid and there left until their bones fell through to the ground beneath. But it now appears that the towers are filled up with concentric rings of masonry, on which the dead are placed by the priests, and there left until the birds have cleaned the bones, which are then all swept into a deep central pit.

The books presented to the Prince occupied a large case to themselves, though, owing to the shape and size of the case, it was impossible to show more than their covers. There were copies of the Bible in Bengali, Hindi, Sanscrit, Panjabi, Tamil, and other languages, besides numerous translations of the Book of Common Prayer; there were also several handsome albums, most of them filled with views of Indian scenery.

One of the most interesting cases was one in which were shown all the caskets containing the addresses of welcome presented to His Royal Highness during his tour, and these were in all possible styles; some, such as the silver and gold casket presented by the Freemasons of Bengal, and the large silver-mounted bison's horn, which contained an address from the residents of the Neilgherries, were remarkable for the excellence of their workmanship.

Others were of exclusively native design; among these may be mentioned the casket presented by the inhabitants of Tanjore, and that presented by the native Christians of the Punjab; both these were of silver, the former ornamented with representations of temples and processions in gold relief, and the latter with chased shawl patterns all over it.

From Lahore came a handsome ebony and silver casket, from Armitsur one of solid chased gold, from Colombo one of ivory,

surrounded by a border of gold and precious stones, while the Masonic Grand Lodge of Burmah sent a characteristic silver bowl, with cover and stand.

Calcutta, Madras, and Bombay, were naturally not behindhand; the casket from Calcutta was of silver, surrounded at the base by a kind of flower-bed of gold and silver lotus-flowers and roses, and surmounted by an ornament made of tigers' claws; that from Madras was of ivory, surmounted by a gilt figure of a tiger, and the Bombay casket was of silver and ebony, with an ivory and inlaid pedestal.

Close to the caskets were the trowels used by His Royal Highness in laying the foundation stones of public institutions and monuments, and the hammer used at the opening of the Alexandra Railway Bridge over the Chenab; this hammer was of "Kuftgari" work, or steel inlaid with gold, and the casket made to hold it was of the same material. Among the trowels were one of gold, used for laying the foundation stone of the Benares Hospital, one of silver, used at the Madras New Harbour Works, and one of silver, with ivory handle, used when laying the foundation stone of a monument to the Native Soldiers who fell in the defence of the Residency at Lucknow.

The contents of this case alone offered some souvenir from almost every place of importance visited by the Prince of Wales during his progress through India, and therefore form a collection which ought not to be dispersed; indeed, were a room set apart in one of our Museums, or elsewhere, for the preservation of all such records, the collection would in time become one of considerable historic value.

The remaining objects of attraction in this room were but few; there was, however, one which was apt to be lost sight of or considered as of no value, owing to its position in the middle of a case of toys and other miscellaneous objects, to which no proper groups could be assigned.

This was the crown presented by the "talookhdars," or native landholders of Oudh; it was very large, made of velvet richly embroidered with gold, and ornamented with pearls, diamonds, emeralds, and enamel; notwithstanding its value, the effect of the crown was far too theatrical and tinselly to be pleasing.

On the top of a case was a pair of elephant tusks, mounted with gold; these were the largest which have as yet been produced in the Travancore Ghaut Forests, where ivory has been a Royal monopoly from time immemorial.

Another specimen of ivory, though in a widely different form from the preceding, was a "Musnud," consisting of a mat and bolster-cover made in Sylhet of strips of ivory as fine as grass, with a little gold thread in the border; these mats are much prized in India, because they are generally used as seats by Royalty in State ceremonials.

Close by was a model of a large astronomical clock, which is in existence in the Ramnuggur Fort; the clock shows the sign of the Zodiac, the phase of the Moon, the day of the month and week, and the time; it is entirely the work of a native artisan.

Finally, after inspecting the presents, the visitor came to two cases in which he had an opportunity of seeing the photographs of the majority of the donors of the presents, *i.e.*, of the various Princes and Chieftains of India. This series most appropriately concluded the visit to the Prince's collection, but before passing on to the next room of the Museum, a few words must be devoted to the collection of very clever and interesting sketches which decorated the walls; these were by Mr. Sydney Hall, the artist who accompanied the Prince throughout his progress, and will, when worked up into their final form, thoroughly illustrate all the principal incidents of the tour, beginning with the embarkation at Brindisi, and a sketch of the harbour, going on with sketches of scenes on board the *Serapis*, and lastly, passing to India, and representations of the most interesting occurrences there. Space would fail were we to attempt a description of each of these pictures; they were all excellent, and none more so than the illustrations of scenes in the hunting expeditions; in the "Crossing a Nullah" there was a thorough medley of elephants in all positions, some descending one bank of the "Nullah," and others ascending the opposite bank, many of them laden with the trophies of the chase—tiger, bear, and deer—others either carrying the sportsmen or laden with the stores, not forgetting one, perhaps the most important of all, which was burdened with a huge ice-chest.

The sketches of the "Elephant Fight in the Amphitheatre at Baroda," and the "Measuring of the first Tiger," recall other interesting episodes, while another picture shows us Sir Salar Jung's mode of getting over the rough ground in the jungles, viz., by mounting on the back of one of his attendants.

The next room is the central room of the upper gallery of the Museum, and contains some of the best specimens of all the various groups of art manufactures. A large central octagonal case is devoted to silver and gold ware, and to a few specimens of metal work, such as "Kuftgari," or "Bederi," in the decoration of which gold or silver is employed; on each side of this case are wall-cases in which the finer specimens of swords and daggers and shields are exhibited, and in other cases about the room are specimens of jewellery, shawls, and kincobs, metal-ware, sandal-wood and ivory carving; here is also a superb collection of bowls, plates, vases, &c., carved out of jade and rock-crystal, and many of them inlaid with precious stones; most of these specimens were purchased from the late Colonel Guthrie.

The collection of arms occupies the greater part of the next room; it is arranged on the walls in groups, in such a manner as to show the different forms of weapons which are employed by the different races of India; the best specimens of matchlocks are in glass cases.

Along one side of the room runs a large glass case, in which are some of the oldest specimens in the Museum, such as the well-known figure of a tiger worrying an European soldier, which was constructed to amuse Tippoo Sultan, Runjeet Singh's throne,

and several other relics, which used to attract visitors to the Museum at the old East India House. Here also commences the ethnographical collection made by Sir Douglas Forsyth, during his mission to Yarkand, which is very interesting, as giving us some insight into the manners and customs of the inhabitants of those little known regions. This collection is continued into the last room of the Museum, and there also we find the ethnological collections made by Mr. Shaw in Kashgar, and by Dr. Leitner in Dardestan.

The remainder of the room is occupied by the collection of idols, and of articles which are used in the performance of religious ceremonies, and lastly by a very complete and interesting series of clay and wooden models, illustrating the different castes of natives and their manners and customs.

The walls of this room are covered with copies of the fresco paintings which ornament the Buddhistic caves of Ajunta, and also by photographs of temples and other buildings in all the various styles of architecture which have prevailed throughout India from the earliest period of which we have any trustworthy records.

With this room concludes the visit to the India Museum, but it is a visit which may be paid over and over again with profit; although the Prince of Wales's collection is no longer there, yet the Museum collections are being, day by day, got into more perfect order, and are being constantly supplemented by private donations.

J. R. R.

NOTE.—I must here record my thanks to Dr. G. Birdwood, of the India Museum, and also to Mr. R. Phillips, of Cockspur Street, for the kind way in which they have afforded me valuable information.

THE PHILADELPHIA EXHIBITION.

AFTER five years of preparation, the great International Exhibition of America was opened in Fairmount Park, Philadelphia, on the 10th of May, 1876, by the President of the United States. The members of the Cabinet and Legislature were present, as were also the Diplomatic Corps, Foreign Commissioners, and His Majesty Dom Pedro II, the Emperor of Brazil. The opening ceremonies were simple and businesslike; and after the President had made a tour of the buildings, and the machinery had been set in motion in his presence, the Exhibition was declared open, and some 76,000 paying visitors streamed in at the gates, which, together with the vast throngs of invited guests and persons entering without payment, may be taken as swelling the grand total of persons present on the opening day to between 120,000 and 130,000.

Fairmount Park, 236 acres of which have been enclosed for the Exhibition, is the largest park, in the near neighbourhood of a city, in the world. It covers 2,991 acres of ground, while the Prater at Vienna has 2,500, Richmond Park, 2,468, and the Bois de Boulogne, 2,158.

The ground chosen for the Exhibition is well adapted for the purpose. It forms an elevated plateau, with three spurs jutting out towards the Schuylkill River, separated from each other by deep wooded ravines, through which flow small streams. One of these ravines—Lansdowne Valley—is spanned by two bridges; the other—Belmont Valley—by one bridge. The height of the plateau above the Schuylkill is 120 feet; its three spurs are occupied by the Art Gallery, the Horticultural Hall, and the Agricultural Hall; while the broad plain, where they unite, contains the Main Building, Machinery Hall, the American Government Building, the Women's Pavilion, Judges' Hall, and a host of smaller erections, including the timber-framed house, somewhat in 16th century style, which forms the head-quarters of the British Commission. Just behind this last are the rounded slopes of George's Hill, on which an "elevator," some 300 feet high, has been constructed.

The grounds are traversed by five spacious avenues, and immediately fronting the "Trois Frères Provençaux" Restaurant is a lake covering about 5 acres of ground, with sloping banks turfed with grass, and planted with shrubs, having also a fountain in the centre.

The following figures may give a fair idea of the magnitude of the enterprise :—

Space occupied by buildings	60 acres.
Cost of the Exhibition Buildings	£1,600,000.
Length of avenues and outside walks	7 miles.
Number of entrances (corresponding to the original number of States)	13 miles.
Number of exhibitors to whom space allotted	60,000.
Cost of the great Corliss engine which supplies the motive power in Machinery Hall	£40,000.
Number of buildings within enclosure	over 160.
Number of nations exhibiting	37.
Length of narrow-gauge steam railroad conveying visitors through the grounds	5½ miles.
Promenades in Main Building, Machinery Hall, Agricultural Hall, Horticultural Hall, and Art Gallery	25 miles in length.

Quantity of materials used in main building :—

8,100,520 lbs. of wrought iron.
1,100,000 square feet of metal roofing.
250,000 square feet of glass.
292,000 square feet of cast iron.
7,000,000 feet of timber.
450,000 bricks.

The main building is in the form of a parallelogram, extending east and west 1,880 feet in length, and north and south 464 feet in width. Its central span, in which is situated the grand avenue, is 1,832 feet by 120 feet, being the longest of this width ever introduced into an exhibition building. The larger

portion of the structure is one story high, and shows the main cornice on the outside at 45 feet above the ground, the interior height being 70 feet. In the centre are four square towers, 120 feet high. The façades at the end are 90 feet high, and the corner towers 75 feet. The framework is of iron filled in with wood and glass in the quantities mentioned. The areas covered are :—

Ground floor	872,320	square feet	=	20·02	acres.
Upper floors in projection	57,344	„	„	·85	„
Upper floors in towers	26,355	„	„	·60	„
	956,019	„	„	21·47	„

The ground was prepared, and foundation laid for the Main Building in the autumn of 1874, and the completed work accepted from the contractor, Mr. R. J. Dobbins, February 14th, 1876; its cost was about £300,000. This building, thoroughly fitted for its purpose, might alone make the reputation of its skilful architects, Henry Pettit and Joseph M. Wilson, who, immediately on returning from their official special mission to the Vienna Exhibition, set about planning the vast structure we have been speaking of.

The following figures will give some idea of the extent of material in the Main Building :

Running feet of rolled iron of different sections, about 141 miles.

8,100,000 lbs. wrought iron, at 487 lbs. per cubic foot = 16,633½ cubic feet = solid cube with sides, 25′ 6″.

292,000 lbs. cast iron, at 450 lbs. per cubic foot = 650 cubic feet = solid cube with sides, 8′ 8″.

8,392,000 lbs. wrought and cast iron (16,633½ + 650 cubic feet) = 17,283½ cubic feet = solid cube with sides, 25′ 10¼″.

West of the Main Building is Machinery Hall, also designed by Messrs. Pettit and Wilson. Its length is 1,402 feet; its breadth 360 feet. Its cost, including all the adjacent boiler houses, machine shops, and saw mill, was about £140,000, and its construction was completed in about eight months from the time the building was commenced. The floor room is 510,000 square feet, and the mean height 60 feet. It contains machines for working in metal, wood, glass, clay, stone, fibre, paper, and gum; also prime motors, such as steam, air, gas, and petroleum engines. There are annexes with machines for working in leather, quartz, &c., and saw mills, and many other processes. On the south side of the parallelogram forming the main body of the hall is the hydraulic annex 208 × 210 feet, with a tank 8 feet deep and 60 × 106 feet. On either side of this tank are the pumps, each discharging overhead into the tank at an equal height, about 15 feet above the surface of the water. At the southern extremity of this annex is a tank raised 33 feet from the floor of the hall, and pouring a cascade of water of 36 feet in breadth, the sheet of water having a weir depth of about four inches. 30,000 gallons of water per minute are raised by two rotary pumps, each driven by an engine of 150 horse-power.

Eight main lines of shafting are provided for the machinery in the avenue and aisles, the greater part being speeded to 120 revolutions per minute, and one line to 240 revolutions. The motive power for the machines is supplied by the great double-acting duplex vertical engine, named after its inventor, Mr. George H. Corliss, of Providence, Rhode Island, the smallest State in the entire Union. This engine stands about 40 feet above the circular platform, which is 56 feet in diameter, and 3½ feet above the floor of the hall. It has cylinders of 44 inches diameter and 10 feet stroke. Between the vertical engine is a fly-wheel of 56 tons weight, 30 feet diameter, and 24 inch face, making 36 revolutions per minute. The twenty tubular boilers are in a separate building; each represents nominally 70 horse-power, the work of the engine at 60 lbs. pressure being about 1,400 horse-power.

It would not be possible, except in a publication devoted to mechanics, to do any measure of justice to the vast collection of machinery in this hall; moreover, elaborate articles on the subject have appeared in various English and other periodicals.

Among the many minor buildings in the grounds must be mentioned a glass manufactory, with its furnaces and all necessary appliances, as well as a staff of skilled workmen; where the whole process of glass melting, blowing, and manufacturing is shown in active operation. Owing to the immense space occupied by the exhibition grounds, various means of aiding visitors were required from the commencement; rolling chairs especially were found necessary for ladies both within and without the buildings, while the railway already mentioned as running round the grounds was always crowded.

The Horticultural Hall, situated north of the Main Building and Art Gallery, is one of the most attractive portions of the Exhibition. Built in a Moorish style of architecture, it forms a handsome structure, 383 feet long by 193, of stone, brick, glass, and iron, and is intended to remain as a permanent feature of Fairmount Park. This building was completed by the contractor on 1st April, 1876, at an outlay of £60,000. The grounds facing the Hall have been symmetrically laid out as flower gardens, and under cover in the immediate vicinity various floricultural exhibitions have taken place. Among these may be mentioned John Waterer's collection of rhododendrons, presented by him to the Commissioners of Fairmount Park, and a rose show, comprising 1,000 varieties contributed by the Grand Duchy of Luxembourg.

The Agricultural Hall, which was constructed in seven months at a cost of £52,000, stands north of Horticultural Hall, and presents to the eye a mass of green roofs, having somewhat the character of the exterior of a Russian church. Its extreme dimensions are 540 feet in front by 820 feet in depth, and it encloses a space of 12 acres in extent.

America was naturally desirous of showing the world on this

occasion her achievements in agricultural machinery, and this will explain the United States being assigned 147,099 square feet of space out of a total of 236,572 square feet. Great Britain and her colonies (excepting Canada, which received 10,094 square feet) were allotted 18,745 feet. Here are exhibited not only all the processes, machinery, and products of the farm, the orchard, the garden, but of the fisheries from various parts of the world. Probably in this respect the Philadelphia Exhibition is unrivalled. The long rows of aquaria along the eastern wall contain food fishes of lake, river, and sea; salt water reaching the grounds daily from the ocean for the marine animals. Cotton, wool, seeds, timber, tobacco, guano (in hermetically closed cases), coffee, rice, ropes, fibres, biscuits, ham, lard, preserved fruit, vegetables and meats, sausages, oils, spices, gums, medicines, liqueurs, silk-worms and cocoons, starch, &c., were here to be found in quantity.

Directly east of Agricultural Hall and in the extreme north-east corner of the grounds is the Brewers' Building, an ornamental wooden structure 272 feet long by 96 feet wide, with a central tower 60 feet high, erected at a cost of £6,000. It contains a complete brewers' industrial exhibition of malt liquor (here dispensed to the multitude gratis), malt, hops, and all the mechanical appliances used in every branch of the trade. The refrigerating store house adjoining, 80 feet by 70, is divided into three compartments, used respectively for storing ale in bulk, malt liquor on draught, and lager beer, that German beverage which has found a new home on American soil.

In a central position in the grounds and within easy reach of the Main Building, was a structure bearing the somewhat homely designation of "Department of Public Comfort," but forming a very excellent feature of the Exhibition. A capacious building, with a frontage of 275 feet, and an average depth of about 100 feet, was designed pre-eminently as a place of rest and of convenience. There were separate rooms for ladies, a lunch counter, a barber's shop, ladies' hairdressing rooms, a boot-blacking room, &c. Visitors could deposit their coats, cloaks, umbrellas, and packages. The lavatories, which here, as in all parts of the building, and, we may add, all over America, are *free*, were completely furnished. Letters could be received and written, telegrams despatched, and messages sent by hand from this admirably organized department. We have seen nothing of this kind in Europe, indeed, we Europeans can scarcely reconcile with our preconceived ideas an establishment where desks and easy chairs are *free*, where a visitor can put down his own name, with date of arrival and departure, in a register, and find out in the same way all about his friends, and this without cost. Adjoining the Public Comfort Department are the head quarters for the Press; and here again excellent arrangements were made. The entire department was under the control of an ex-journalist, who saw not only that paper, pens, ink, and pencils were provided for correspondents, but also was ever ready to give them information

on any point on which they might not be "posted." Close by this again is the structure styled Judges' Hall. It is 152 feet long by 115 feet wide, with a spacious hall (60 feet by 80 feet, and 43 feet high) for the sessions of the entire body of 200 Judges of Awards. This Hall is surrounded by a number of smaller rooms, where the groups of judges conferred on the subjects especially entrusted to them, and wrote their reports.

Near the Judges' Hall is the large Carriage Building, with a frontage of 346 feet and a depth of 231 feet. The great feature of this building was the handsome display of Pullman drawing-room and sleeping cars, fitted up with extraordinary completeness.

Adjacent to the carriage building is the Swedish School-house, an ornamental structure of hard pine wood, some 60 feet by 36 feet, and 25 feet high, containing one of the most interesting displays in the entire Exhibition. It represents a country school-house, and it should be observed that everything in and about it pertains to the class of primary instruction. Capable of accommodating fifty children, in compliance with the Swedish law of 18th June, 1842, it contains a schoolroom 40 feet by 22 feet, and 12 feet in height, thus allowing 211·2 cubic feet of air and 17·6 square feet of floor space to each child, while the area of the windows would be 3·6 square feet for every pupil. Within this building will be found everything that can conduce to the more facile imparting of instruction, as well as to the comfort, convenience, and health of the children. Pine tar is extensively employed in these schools for the purpose of purifying the atmosphere. The lowest class of school in Sweden is the infant or small school, originally introduced in districts where the population was much scattered. Here the teachers are usually females, and they prepare the children for the primary schools we have just spoken of, where natural history, geography, drawing, chemistry, physics, grammar, geometry, gymnastics, and drilling, are taught. These primary schools are under rigid periodical superintendence, and the teachers must have attended the higher (Normal) school at least three years, and have obtained a certificate from the same. Next come the higher primary schools, where superior instruction is imparted, then the grammar or high schools, divided into the realistic and the humanistic branches. Under the former are taught German, French, English, algebra, physics, and chemistry. Under the latter the pupils are also instructed in Latin, Greek, and Hebrew, and thus prepared for entering either of the two universities, Upsala or Lund. Besides all these there are seven higher technical schools, and schools of navigation, agriculture, and forestry. There are also the national high schools, where grown persons of twenty, thirty, or forty years of age are educated to become good citizens; instructed in the laws, municipal institutions, and general administration of their country; taught surveying, chemistry, physics, and book-keeping; and where, once a week, a sort of court of common council is held, in order to train their minds for administrative work. To

these schools, established by private benefactors, Sweden owes much of her independence and purity of spirit.

We have now reached, in our circuit of the grounds, the broad terrace, well turfed and planted, on which stands the imposing and ornate Memorial Hall, or Art Gallery, of the Exhibition. Built at a cost of £300,000 by the State of Pennsylvania and the City of Philadelphia, this structure is intended, after the close of the Exhibition, to become a second South Kensington Museum, containing the embryo of an industrial and fine art collection. A fire-proof building in modern Renaissance style, it is constructed of granite, glass, and iron. Its general design is a parallelogram, 365 feet long by 210 feet wide, and 60 feet high, relieved by square towers at each of the four corners, and by projecting vestibules and steps in the middle of each of the long sides. The building covers an acre and a half of ground, and is surmounted in the centre by a four-sided dome, rising 150 feet above the ground, capped by a colossal ball, on which is placed the figure of Columbia. Gigantic figures stand one at each corner of the dome, representing the four quarters of the globe. A detailed description of the well lighted and well proportioned rooms within is unnecessary; they contain 75,000 square feet of wall space for paintings, and 20,000 square feet of floor space for statues, &c. The skylights throughout are double. The usual difficulty of ventilation has not been overcome, and complaints were justly made respecting the imperfection of the structure in this respect. The architect of this building, of the annex adjoining it, and of the Horticultural Hall, is Mr. H. J. Schwarzmann, son of the celebrated fresco painter, Joseph Schwarzmann, of Munich. Thirty-four of the buildings in the grounds are designed by him.

We shall not venture to dwell at any length on the contents of the Art Gallery; it would be impossible to do so without taking up far more space than our limits allow. The English collection has been especially praised, and certainly the list of those distinguished persons—from H.M. the Queen and H.R.H. the Princess Louise, downwards—who have lent some of the paintings in their possession with a view of making the collection a more complete one, is larger than on any previous occasion of a similar kind; unfortunately, these valuable works, with abundant space and fine light, were hung almost as badly as was possible. As to the American collection, it is conceded by all candid Americans that it is not worthy of the country, which in 100 years of progress in other fields has been able to accomplish so much. Just as Germany has been severely and justly blamed for having sent two "Surrenders at Sedan" to an exhibition where the room allotted to her opens immediately on to the French Gallery; so the authorities in charge of the Fine Art Department committed a grave fault in admitting into the United States section such pictures as Rothermel's "Battle of Gettysburg," and Hicks's "General Meade." Both are bad, but the former, conceived in the worst taste, and mimicking in its style French battle-pieces,

themselves bad, is contemptible in point of art, and should have been at once emphatically refused admission.

The loan collection, gathered for a philanthropic project at New York, obtained, unfortunately for the Exhibition, all the best American pictures, but some artists of repute in their own country contributed specimens of their work. Among them may be named La Farge, who sent "St. Paul," and a subject of a "Boy and Dog;" Whittredge "Pilgrims of St. Roche," and "Woods of Ashoken;" Robert Weir "Taking the Veil;" Ritchie "Death of Lincoln," &c.

Austria contributed largely to the galleries, but beyond comparison the most notable work was Makart's immense canvas, 34 ft. by 14 ft., of "Venice doing homage to Catherine Cornaro," when, on the death of her husband, the King of Cyprus, she made a free gift of that kingdom to the Republic of Venice. This remarkable picture has been so often described, criticised, and praised, that it is unnecessary to dwell on it here, otherwise than to say that it attracted, as it deserves, not only observation but study. Ernest Lapte, Friedlaender, Kuntz, Ch. Mueller, and others, were fairly represented; and in water-colours, Ralph and Franz Alt sent admirable works. Unger's artistic and effective etchings were also illustrated by some seven or eight works. There were busts in marble lent by the Emperor of Austria, and some works in bronze.

Italy is most noted in the Memorial Hall for her efforts in sculpture. A large collection of works in marble has been sent—some 300 busts and statues. Of all these, scarcely one quite emancipates itself from the pervading error of modern Italian sculpture—the attempt to produce *tours de force* in marble, incredible drapery, veils and lace, and all the impertinences of detail, forced into prominence. Some pieces are in this direction nearly as bad as they can be, and unfortunately, till a purer taste is disseminated, they will find admirers and purchasers. The skilful finish of Italian work is not for a moment to be denied or despised, and such finish, if applied to worthy design, would be of the utmost value, but at present this excellent manipulation, for it is excellent in its way, is often wasted on meretricious and tawdry or ill-conceived subjects. Exceptions there were—the efforts of men of a more serious order of thought—but these served rather to prove the rule than to vindicate for that ancient home of art its true place among the nations.

Germany contributed to the Exhibition a very large collection of paintings, many by artists of distinction, and among them canvasses of great size, the transport of which was no easy matter. It would have augured better taste had some of these, for example the two representations of the surrender at Sedan, been retained at home, but that was more than could be expected of triumphant Germany.

In a suite of the smaller rooms of the Memorial Hall was shown, arranged with much judgment and skill, the well-known collection lent by Signor Castellani; this it was which had been

offered by him to the British Museum, where the acquisition of at least a portion of its treasures was earnestly desired, but the usual Government difficulty—no money for Art purposes—interfered, and so it found its way, like the Cesnola Collection before it, to America, and there is not unlikely to remain. Great efforts—despite the depression of all business, and the consequent scarcity of money—will be made, before this collection, so rich in many of the objects most needed by a nation wishing to advance in its career of art, will be allowed to return across the Atlantic. Its contents are well known here, by the able notices of it which appeared in various publications, but notably in the "Times" during its brief stay in London, and therefore it is unnecessary to go into detail now, even did our space permit; it may, however, be observed that in its various sections of ancient sculpture in marble, works in bronze, goldsmith's work, gems, illuminated manuscripts, majolica, &c., there are important and some even most precious specimens.

Passing from the Memorial Hall, the visitor was likely to be attracted by the annex immediately behind it. This building will also be permanent; it is of brick, of simple design, but affording 60,000 square feet of wall-space for the display of pictures. Among other objects of some interest shown within it were various specimens of painted glass—a few of the windows being the productions of American artists. East of the Memorial Hall was the Photographic Exhibition, containing a very large collection, where almost all the nations who contributed to the Exhibition were represented.

In the country where the advocates of women's rights are more powerful than anywhere else, it was perhaps natural that there should be a "Women's Pavilion," for the display of the products of feminine art, skill, and industry. It was an irregular domed wooden edifice, 208 feet by 208 feet, situated as nearly as possible in the centre of the grounds. The building cost some £6,000, and it has been rather too prominently put forward how it was originated and paid for by the women of America.

We turn now to what, for the non-American at least, is one of the most important parts of the Exhibition—the U.S. Government Building, where are illustrated the functions of the Government in time of peace, and its resources as a war power. It covers about two acres of ground, and cost some £22,000. Its floor space has been divided in the following proportions:—

	Square feet.
War Department....	11,200
Navy ,, ...	10,400
Interior ,, ...	20,600
Treasury ,, ...	3,000
Post Office ,, ...	3,800
Smithsonian Institute, including Fish Commission	26,600
Agricultural Department	6,000
Total ...	81,600

Every one of these departments had made a rich exhibition from its precious stores, the objects having, in very many cases, historic interest, some appertaining to the aboriginal inhabitants of the country, the settlement of the revolutionary struggle, the latest wars; others to the arts of peace, progress, surveys, inventions, scientific expeditions, discoveries, and natural resources; the latter embracing metallurgical and other mineral wealth, animal and vegetable productions, and manufactured articles. There was no part of the Philadelphia display that so recalled to the mind the magnificent Polytechnic Exhibition at Moscow in 1872, where everything concerning any one particular branch of a nation's industry was exhibited *ab ovo* to its highest development. We shall briefly mention some of the objects on view. The War Department has a full collection of rifle-ball and cartridge-shell machines, which, by means of shafting and belts, are set in motion and working the greater part of the day. There is the famous machine for making compressed lead bullets, machines for successive operations upon the copper plates, a Blanchard lathe, adapted to turning gun stocks, &c., &c. Sixteen different machines are required to make a complete cartridge; 500 cartridges per hour is the average quantity thus manufactured. There are also a variety of arms, from the old flint musket to the breech-loading rifle; and figures representing the uniforms of the army at different periods of the century. The Gatling gun was here exhibited, as also models of fortifications, maps, engineering apparatus, and army equipments generally. Opposite the Army was the Navy Department, where was exhibited a model, measuring 41 feet in length, of the frigate *Antietam*, full rigged, and equipped with an armament of 22 guns. There were a variety of guns for special services, such as boat howitzers and gunwale guns; also every description of cannon balls and shells, cutlasses, swords, &c. Every kind of naval stores, from the cables to the ship's biscuit, and the complete marine outfit was shown, as also all the requisite scientific instruments, compasses, barometers, sounding apparatus, velocimeters, and ship's logs. There were torpedoes, fathom lines, life-size figures representing the uniforms of the Navy at different periods, portraits of celebrated naval men, and flags in profusion.

Near this was the Post Office Department, fitted up exactly like an American post office, with the lock-boxes for subscribers all opened by separate keys, and these and every other feature of the department in full working order. The benefit of this Exhibition post office was enormous; the entire correspondence for the different buildings within the grounds being distributed from this centre; and in like manner the letters which were collected hourly from the pillar boxes, scattered here and there throughout the buildings, were all conveyed to the Government office for sorting and forwarding. To give an idea of the amount of business done at this admirably organized Centennial Post Office, it may be mentioned that in June 137,983, and in July

139,766 letters were delivered throughout the buildings from this centre, besides 76,186 newspapers in June, and 85,018 in July. The number of letters collected from the boxes in different parts of the buildings amounted to 152,187 in June, and 167,587 in July; papers collected, 38,378 in June, and 50,970 in July. Ten regular carriers and six clerks were constantly at work in this department, while four mail carts were employed to bring and fetch away the letters every hour, and letters were usually delivered in any part of Philadelphia four hours after being posted. Foreign money orders were issued from the Centennial Post Office, and registered letters accepted. The envelope machine adopted by the U.S. Government was shown, and by it, in the presence of the visitors, 20,000 perfect stamped envelopes per diem were turned out. The stamps were specially for the Exhibition year, and bore the Centennial imprint, so that most persons visiting the Exhibition purchased the embossed envelopes —the envelopes themselves being reckoned at the rate of one shilling per hundred; and were thus enabled to send their friends letters which bear unmistakable marks of their having been "to see the show." The cars carrying the mails by rail were also exhibited, the service of sorting and distributing the letters taking place therein. In the Interior Department, the Patent Office exhibited some 5,000 models, arranged in classes, 60,000 patents bound in series. Even on those pretty well acquainted with the importance of the Patent Office at Washington, the development that has taken place in that Bureau, as evidenced by such a display, cannot fail to create a striking impression. In the office formerly occupied at Washington by the Patent Department were deposited, in 1840, owing to its being a fire-proof building, the relics of Washington—his clothes, camp-equipage, punch-bowl, and furniture. These, having remained in the keeping of this Bureau, now formed part of its exhibition. The Bureau of Education was well represented; and the Bureaux of Land, Census, and Pensions sent maps and charts which gave, in geographic and tabular forms, the great figures of American progress, the rate of settlement of public lands by decades, the condition of the country, and the distribution and area of its pension agencies. The United States Geological Survey, under the charge of Dr. F. V. Hayden, made so complete a display as to draw from the eminent German geographer, Dr. Petermann, the remark, "We have no organization like this in Europe." The Agricultural and the Treasury Departments' exhibits were most interesting; but of the highest importance was the display made by the famous Smithsonian Institute at Washington, which, it may be parenthetically observed, will have become considerably enriched at the close of the Exhibition, many of the foreign countries having already presented it with some of the more valuable scientific objects exhibited. The ethnological and archæological collection of the Smithsonian Institute was wonderfully complete, and from it much might be learnt respecting the early races, perhaps even the

aborigines, of America. The zoological and botanical collections, the food-fishes collection, and the display of precious metals, iron ores, manufactured iron, and coal, would furnish instruction for the longest possible period the visitor could devote to them. On the outside of the building, in the rear, was the Ordnance Laboratory, and next to this one of the most valuable departments of the Exhibition, viz., the Medical Department of the U.S. Army. Here the hospital system was illustrated; and here, too, were a staff of doctors ready to attend to any cases that might be brought in. It need hardly be said that, in such a vast enclosure, and where there was so much machinery working, accidents of some kind were inevitable, and thus the central position of the department proved of the utmost importance. But beyond this, during the very hot weather of July and part of August, a great number of persons visiting the Exhibition were completely overcome by the heat, and, but for the restoratives and the medical aid so near at hand, many of these cases would have turned out very seriously. Besides this, the little army of Centennial guards who lived, ate, and slept on the grounds naturally required frequent medical visits, and hence this Bureau was a most valuable adjunct to the Exhibition. Adjoining this building was a small iron structure, a model of a lighthouse, and from here the steam fog horn announce to the world the hour of the day. This fog horn was on exhibition, it is said it could be heard at 30 miles distance, and every one we have met would have desired it to be removed at least that distance.

A brief notice may here be given to some of the States Buildings, a portion of the Exhibition which was eminently new and characteristic of the "great Republic." All of these State Buildings were places of rest and recreation, not only for the visitors from the particular State, but also for outsiders. Every one was made welcome; and the easy chairs, the sofas, the iced water, and the newspapers, stood invitingly at the disposal of all visitors. These States Buildings must be distinguished from the houses or pavilions of the different foreign nations. There, as, for instance, at the English St. George's House, there was "no admittance except on business," unless with tickets to view the interior of the house. Not the least interesting of these State buildings was the Mississippi log cabin, every foot of the timber in which was shipped from Mississippi and put up by Mississippi carpenters. With its walls of native wood fresh from the forest, its rustic-framed windows, Gothic doorway, and overhanging eaves, fringed with long delicate moss, its balconies of naturally and curiously carved roots and limbs, and its reminiscences of the untrodden forest, it formed an object of interest to strangers. Sixty-eight different kinds of wood have been employed in the superstructure, not including the door panels, which are made of forty-eight different varieties. The door and window-frames are made of many varieties of pine, the outside walls being chiefly of hickory, split logs with the bark on. The entire edifice was rich in ornaments found carved by nature in the

Mississippi forests, while the inner walls were of finely polished specimens of every kind of pine. The porticoes on both sides were ornamented with mosses, while from the arched verandahs were noticeable many hanging baskets. Wisconsin had nothing but a very comfortable building to show; Arkansas an octagonal structure with a dome-shaped roof; here were exhibited forty varieties of the woods of that State, silver, lead, iron, and coal, ores and cereals; Novaculite, said to be the finest oilstone found anywhere, was displayed in quantities. Maryland had an attractive display in her building, minerals, and appliances used in her extensive oyster and fish business; also some interesting portraits, including a fine one by Sully of Lord Baltimore, and another of De Halb. Ohio had a handsome building of wood and stone, the walls of which were contributed from twenty-eight different quarries. Within were photographs of the nine surviving heroes of Perry's victory on Lake Erie, surrounded by a frame made of wood from the old flag-ship *St. Lawrence.* In the Indiana drawing or reception room was a Centennial chair, made of 100 varieties of wood, each piece being labelled with its designation. The Kansas and Colorado building, constructed for the joint use of the visitors from these two States, was remarkable as containing Mrs. Maxwell's museum of stuffed birds and other animals from the Rocky Mountains—400 specimens of various animals, and 300 varieties of birds. This is in the Colorado portion of the building, and the lady taxidermist—the term is invariably used in America—who not only prepared the animals, but killed most of them, was a feature of the Exhibition. Mrs. Maxwell has for years shot left-handed, and has acquired great precision in her aim. She claims to have killed and stuffed 500 wild animals, and among the stuffed ones exhibited were several large bisons, a number of deer, including the red deer, a pair of Rocky Mountain sheep, a puma, wild cats, two elks, three bears, a wolverine, many varieties of rabbits, marmot squirrels, mountain cats, a black-footed squirrel, &c. The display of Kansas was a remarkable one as regards its magnificent agricultural produce. There is, for instance, winter wheat 5 feet high, yielding 45 and 52 bushels to the acre. The Michigan building was artistically designed, made entirely of native woods, and the interior adorned with oiled and polished wood of every variety produced by the State. The Connecticut building was a very small plain structure, painted yellow, with brown stripes, the interior being finished in unstained woods.

Having now glanced, as far as space will permit, at the chief attractions of the Exhibition grounds, we return to our starting point, the Main Building, which contained a rich store of objects of interest from almost all parts of the world. It is satisfactory to us to know that the display made by Great Britain was in more than one respect the best. Although one-fifth of the entire space in the Main Building was occupied by Great Britain and the Colonies, and more than one-half of this was taken up by

the former and India, yet the space allotted was found insufficient, and this even when the exhibitors had erected pyramidal or conical shelves, thus economizing their floor space. It would be superfluous here to enter into details respecting objects the great bulk of which are more or less familiar to all who know London. The best display, for example, of Porcelain in the whole Exhibition, excepting that of the Japanese, was the collection brought together by Messrs. Daniell & Co., and it was owing to the enterprise and energy of these gentlemen, and their good taste, that England stood first among European nations in this important department. Messrs. Doulton, of Lambeth, were themselves exhibitors, and sent a collection of stone-ware and artistic faïences which quite surpassed all that was shown from other countries. France had some excellent faïences, but scarcely her best, and these were in a different style.

The ceramic collections were altogether very numerous, and in many respects important; but those which naturally attracted an Englishman's notice, regarding them from a commercial point of view, were the products of the United States themselves. The pottery trade in the States has suddenly risen in less than 20 years to an importance that cannot be overlooked. The white "granite" wares and "cream-coloured" pottery now produced, especially at Trenton, the Staffordshire of America, is at least equal in quality of material to anything made in the best factories in Europe; the designs are often faulty, but the body of the ware is of first-rate excellence, and altogether surpasses most European productions—it is only rivalled by the best English goods. The supply of materials is inexhaustible, and with American enterprise and energy, this industry has before it a great future. Already the potters, highly educated and able men, are looking to artistic aid to add to their present resources that which alone is wanting—excellence of design; in industrial processes they are conspicuously successful, but in industrial design they fail. Porcelain also has begun to be made, the works at Greenpoint, New York, sent remarkable specimens; and this porcelain is in one respect a triumph of manufacture; it is as hard in body as the hardest oriental, and has only been equalled in this respect in Europe by the porcelain made at Bristol during a brief period towards the end of the last century. This great success has been attained in the first instance with foreign materials, and this alone gives evidence of the knowledge and skill brought to bear on American manufacture; it cost Europe many and long labours before a porcelain to be compared with this was produced from the very same clays.

Among the collections of another character, which attracted most notice in the Main Building, was the display, a very splendid one, made by Messrs. Elkington. The artistic and highly elaborated objects shown by this firm were looked upon with satisfaction by every Englishman as giving fair evidence of the advanced position which the art of metal-working has attained in Great Britain, and to the Americans this magnificent

contribution to their Centennial Exhibition, prepared without stint of cost, was a source of gratification which it was pleasant to see. Messrs. Elkington win an easy first in such competitions, and they only need to secure, in addition to their present staff of artists, the aid, if such be possible, of a consummate figure draughtsman and designer to place them the highest in artistic metal work of any producers in any country.

Other and very different metal work is also conspicuous in the Exhibition—the cutlery of the United States. There was a time, not long since, when Great Britain was acknowledged to be unapproached in this most important branch of her industry; the fatal system of combinations and consequent strikes, which has prevailed at Sheffield especially, has caused her old pre-eminence to be lost, and it will never return. In all metal manufactures the Americans are daily becoming stronger. One other instance may be quoted,—their wire, of copper, steel, and brass; the exhibition of these was a splendid one; their files and tools are also renowned, and in all European markets.

Placed not far from these triumphs of manufacture, were cases containing book-bindings, and a portion of the collections which were shown by the stationers, bookbinders, and paper manufacturers in the United States. Various other portions of their exhibits were distributed in outlying buildings, as the machinery of their trades, and also the printing presses in Machinery Hall, &c.

Almost every foreign country had contributed to the same department, some of the contributions being of great extent and considerable importance; much also relating to the same class of objects had found its way into the elaborate exhibitions of educational apparatus, which were displayed in great force, not alone by the States, but by almost every nation taking part in the competition. The judges, therefore, of this important group had a heavy task, and one of them told the writer that he had not worked harder for five-and-twenty years. To do anything like justice to the display made, the extent and variety of which was almost overwhelming, would need an elaborate report devoted to this topic alone, and it is to be hoped that some such report will find its way into print. The materials were collected by able men, and should not be allowed to find their way merely into some official pigeon-hole, tied up with repressive red tape.

The Russian Exhibition showed the most remarkable displays of work in various precious or ornamental stones. A superb mantel-piece of malachite was among the striking objects which had been got ready and forwarded to the "Centennial," notwithstanding that only five months elapsed from the time when the Emperor signified his desire that his country should be adequately represented until the day of opening; this interval was most ably used by the energetic and accomplished Commissioner. The mantel-piece was enriched with amethyst bunches of grapes, in high relief, as well as with groups of cherries and other fruits, in precious stones of the

natural colours. Russia is especially rich in stones of value, some to the jeweller and others to the decorative artist. Various and beautiful kinds of jasper and chalcedony, as well as nephrite, are found and made available, as well as the beautiful rhodonite from the Ural Mountains—a silicate of manganese of a delicate pink hue mottled with black.

The Russian Government School of Mines sent some of the largest beryls in the world, of course from Siberia. The display of lapis lazuli, both worked and in the rough, was very fine, and served to recall the St. Isaac's Cathedral at St. Petersburgh. The Russian topazes exhibited were from one to six inches in diameter. The Labrador feldspar and tourmaline sent by that country were also remarkable. Russia also sent the largest display of sapphires in the Exhibition. While on the subject of precious stones, it should be mentioned that Italy sent the finest display of large rubies, a gem, the value of which, when perfect in colour, is greater than that of the diamond. Tiffiny and Co., and Starr and Marcus, of New York, and Bailey and Caldwell, of Philadelphia, had some fine diamonds, purchased for the most part in the great European marts. The Italian chrysolites were very fine. The Hungarian opals from the mines in the Carpathian Mountains, were magnificent. Among them was an opal of 602 carats, said to be the largest in the world. Queensland, be it noted, sent several specimens of opal, as well as of malachite. Amber, that speciality of the shores of the Baltic, was exhibited in large masses, while meerschaum, which is found on the coast of Asia Minor, formed a special feature, in its manufactured state, of the Austrian collection. Alabaster was largely shown by Italy, and the transparent vases, card-holders, boxes, and nick-nacks sent, bore ample evidence to the ease with which this soft stone is carved.

No division of the Main Building, not even the space allotted for the exhibition of costly jewels, was more crowded than the Japanese and Chinese Courts. Something no doubt was due to the natural curiosity of country visitors, to see the natives of these two distant countries, many of whom, the Chinese in their natural costume, were always in attendance near the "exhibits" of their respective empires. The Japanese collection was superb, and in some respects the most successful contribution sent from any country; in porcelain, pottery, bronze and lacquer-work, the Japanese were first. The display of porcelain contained examples, which, as efforts of manufacturing skill, surpass anything hitherto accomplished in Europe. Moreover, the ancient excellence of their decorative designs as applied to ceramic productions has not died out, and some of these quite recent pieces were fit rivals of the splendid works of their ancient artist-workmen. They are themselves now very conscious of the necessity of preserving and adhering to their old art traditions, having perceived the deplorable results of European so-called improvements in their decorative processes. In bronzes,

they retain their unquestioned superiority, since China seems to have in some measure lost that perfection of the art of metal-working, in which she once seemed to have surpassed all oriental races. The Japanese bronzes are some of them wonderful examples of ingenious and elaborate design, and of the most perfect execution. Notably, a very large bronze vase, made from the designs of M. Notomi, the accomplished judge of pottery and porcelain, was the most effective and striking specimen exhibited.

The Chinese collection included ancient enamels, porcelain, and pottery; and among these were specimens of great interest and of undoubted value, from an artistic as well as an industrial point of view. The modern collection was very extensive, much too large for the space allotted to the exhibitors, but in general quality, the works in porcelain, &c., were not of the highest class.

From Japan and China to Turkey, in the Main Building was but a step, and the energetic Commissioner, the Count de la Sala, did his utmost for the collections entrusted to his superintendence. Among these was a very curious and interesting series of the weapons used in Turkey during the last two or three centuries. It was, however, refreshing to cross over from Turkey into Sweden and Norway. These small countries which sent their first colonists to the Delaware, and thence to the North Western States of America, nearly half a century before Penn came over with his followers, made an admirable display of their iron, steel, and general mineral wealth, of their agricultural produce, of their ceramics, of their scientific and philosophical instruments, their furs, their scholastic system, their jewelry, ornaments, and national costumes.

Brazil, with its elegant Moorish pavilion, consisting of a colonnade and wooden pillars, and arches supporting a gaudily painted superstructure, sent a collection that bore traces of the vigilant supervision of its illustrious ruler. Coffee, rice, yams, mandioc, a variety of woods, artificial flowers from feathers obtained from its brilliantly plumaged birds, tropical fruits, cotton, raw and manufactured, and a fine educational display were among the objects exhibited by this productive land. Chili sent a large collection of minerals, agricultural produce, and other articles showing the excellent influence the Santiago Exhibition of 1875, has already exercised in that Republic. Peru, also great in minerals and precious stones, sent, besides her produce and manufactures, a most curious collection of aboriginal antiquities. Among these were several of the well-known but very curious and interesting mummies, some in a remarkable state of preservation. Near them was a large collection of old Peruvian pottery of the usual quaint forms, comprising bowls, platters, jars, and curious water-vessels, in the forms of men and animals rudely modelled.

Although Denmark's display was but a small one, yet its collections of pottery, furniture, clothing, and chemicals, were to be

commended. The Argentine Confederation, consisting of fourteen provinces, held in December, 1875, at Buenos Ayres, an exhibition of the commercial, agricultural, and natural resources of the country, with a view to collect and classify the objects for the Philadelphia Exhibition. The result was an excellent collection of precious ores, variety of woods, gums, resins, hides, &c. Venezuela, Liberia, the Orange Free States, and the Hawaiian or Sandwich Islands, we are compelled by the limits of our space to pass over. As regards the British Colonies, a volume might have been written on the admirable display made by some of them, but as collections of the same complete and comprehensive character were shown in London on the occasion of the last Exhibition, held at South Kensington, it is less necessary to dwell on their contributions to Philadelphia.

Holland made in some respects a very excellent display, one of the chief merits of which was its unshopkeeping (if one may so say) element. Holland's Department of Public Works sent a quantity of valuable and suggestive diagrams, photographs, and models. The collection of Delft carpets was excellent. There were also collections of scientific instruments, besides a number of objects made by the Blind Asylum of Amsterdam. The famous Dutch clay pipes, the best of their kind made anywhere, should not be forgotten. The Dutch Colonies, too, are well represented. Belgium makes such an exhibit as is eminently characteristic of this active, busy, energetic little country, which competes with Great Britain in so many manufactures. Italy has sent glass from Venice, mosaics, and corals, and filigree, gloves, and jewelry; in fact everything she produces that can be sold. That seems to have been the one great dominant idea with the exhibitors, and when we saw sideboards finely carved but surmounted in trumpery taste with a group of cherubs exposing a medallion of Lincoln, and a number of similar baits for hoped-for American purchasers, we confess to a feeling of regret that these shopkeepers had not remained at home, and there awaited their customers. The Egyptian Court looks Egyptian, and that is saying much. The student of the country may here find much to interest him: saddles, and hangings, and trappings, and stuffs woven in silk and gold, and glittering masses of gold and silver flowers, worked by hand on a velvet foundation. There were cabinets of ebony, beautifully inlaid with carved ivory and mother-o'-pearl. Need we say that silkworms, and cocoons, and mulberry-leaves, chemicals, oils, and vegetable syrups, were exhibited? There was red Egyptian pottery from Siout, of admirable decoration, and Arabic books and manuscripts, and much else that was characteristic.

Spain had gathered a collection both of value and interest, but it was still incomplete even at the last moment the writer could visit the space allotted to that once great country. Nevertheless, it may be noted that the mineral wealth of the Peninsula was displayed by considerable collections, and those of value; and the manufactured goods of various descriptions

which still retain something of the oriental influence of the Moors, and show a power of colour unknown to nations of northern Europe. The pottery of Spain is very interesting and instructive, it is marked strongly by traditional influences, and however rude in manufacture, is often very suggestive in elegance of outline, and, as regards the *azulejos* or tiles, in force of colour. The tradition of Roman, or even earlier periods, is evident in the classical forms of the ordinary rude vessels for daily use. Some of these are extremely graceful in their lines, however coarse and imperfect in manufacture. On the other hand, the Moorish influence is still strong in the large painted dishes, and brilliantly glazed and lustred wall and floor tiles. A various collection of these last from many factories was exhibited, and among them some admirable examples of vigorous design and effective colouring; occasionally, but rarely, the brilliant tones in use degenerate and become vulgar, but for the most part, the oriental sense of harmony still controls the workman's taste, and the results are remarkable and instructive. The fine artistic inlay-work of gold on iron, a revived art of the 16th century, for which Spain is justly noted, was here illustrated by some admirable works, the details of which rival, in delicacy and elegance, the productions of the Cinque Cento Milanese artists.

Portugal was more prompt than her neighbour, and the collection, in many sections very complete, was systematically arranged. The silver and gold work, especially the former, for which Portugal is noted, was well illustrated by the Companhia Aurificia of Oporto, and the firm of Vaz Corquinho, also of Oporto, showed jewelry in filigree, &c., often of good design and of extreme delicacy of workmanship; the tradition of East Indian art still favourably affects Portuguese work in the precious metals.

The silk manufacture is one of the most important industries in some districts of Portugal, and accordingly it was here illustrated by collections of the cocoons and raw material, and by the finished productions, some of the latter from Lisbon, being of a high class as to colour, design, and manufacture. The wood carving exhibited is a speciality of Portuguese workmen-artists, and was most remarkable in several examples for beauty of design and extraordinary delicacy of finish; the open-work cresting ornaments are very beautiful, and cut with a truth and freedom which proves a high order of skill in the workman; ornaments were shown carved in satin, rose, box, jacaranda, and other fine woods, forming portions of furniture or of household fittings, many in excellent taste and all of skilful execution. A collection of their best examples would be very suggestive and instructive to our cabinet-makers and wood carvers in London.

The pottery of Portugal is well known in England; much of what is now most successful took its origin from efforts made to reproduce wares in the style of Wedgwood, Whieldon, Davenport, and other English potters, and a mark, copied from that of Davenport, is frequent on Portuguese glazed wares.

On the whole, it is evident that the competition with foreign nations at the various exhibitions where Portugal has been represented, has told with great advantage on the industries of the country.

Switzerland has not, perhaps, so good a display as at Vienna, but the known manufactures for which the Swiss have a deserved reputation, were fairly represented, especially the watches and clocks.

Germany contributed largely to the contents of the Main Building of the Exhibition, but on the whole, not in such a manner as to do justice to the reputation she has gained in either art or industry; the letters of her Chief Commissioner, Professor Reuleaux, have sufficiently pointed this out, and their severity will probably have the effect of stimulating his very practical and energetic countrymen to efforts much beyond what they made on the occasion of the Philadelphia Exhibition. Whether they imagined that they could be *facile princeps* in so various a competition, we know not, but whatever may have been the cause, the result was not fortunate. In one department, for example, that of porcelain and pottery, there was a manifest falling off from the work of previous years, and all the well-known defects of German manufacture, its poverty of colour, and hardness of line, were intensified; most of the works shown suggested a poor *rechauffé*, so to speak, of what had been prepared on former occasions.

It is just, however, to remark on the excellence of the German war material, her heavy guns, &c., and also on the gas-motors, first-rate in their way, shown in Machinery Hall.

The space at our command forbids further particulars of the contents of this vast structure; it remains, therefore, to sum up by saying that we have deemed it more useful to give somewhat minute particulars respecting the nature of the buildings, and the general plan of the whole Exhibition, rather than to follow out the details of special collections or objects exhibited. These last differ only in degree from the gatherings at former great exhibitions, in some more successful and important, in some less, except as regards machinery; in this the display in Fairmount Park is the most remarkable ever brought together.

The effect of the "Centennial" as the Americans like to call their great Exhibition, upon the industries of the United States will be great indeed, and thus the efforts made by the country are likely to be repaid in a not distant future. The interest excited by this vast and ambitious undertaking, at first slowly evinced, at length proved such, that the attendance of visitors is believed to have been greater than that at any previous International Exhibition.

PART II.

ARCHITECTURE AND PUBLIC IMPROVEMENTS, PAINTING, MUSIC, LEGISLATION, STATISTICS, AND CHRONICLE OF 1875-6.

ARCHITECTURE AND PUBLIC IMPROVEMENTS.

1. General Progress.—Art and Public Monuments.

We have little change to record in the architectural position. No very striking event has occurred; no very remarkable building has been completed during the past year. No new controversy has arisen to disturb the calm, or to stir the apathy, which appears to be settling down upon the architectural mind. A discussion of the styles now produces little more effect than a slight and transient ruffling of the surface. Goth and Greek, classical Italian and hybrid renaissancist, the mediæval devotee, and the flippant upstart Queen Anne's man, meet together in ostentatious amity, and when apart speak of one another in terms short of utter contempt and irreconcileable detestation.

It may be but a temporary lull, but it is welcome, and architects and architectural students will do well to avail themselves of the quiet to look around and ascertain what may be their actual and relative position. English architecture cannot remain as it is. In what direction the change will come may be difficult to conjecture, but come it will. Whether it will issue in a breaking away from mere precedents, the emergence of an independent style, or a new form of imitation, or simply a modification of current styles and fashions, will probably depend on the genius, tact, business capacity, or happy audacity, of some one or more of our rising or nascent architects. At present Queen Anne's is the reigning fashion. But it reigns under many variations. Some so-called Queen Anne's garments belong plainly to the Georgian era, others go back, at least, to the second Charles. But, so it be neither Gothic, Greek, nor Italian, it all passes as Queen Anne's now, and if those who devise and those who pay for the work prefer that title, no one else need object. We have not, however, yet carried the revived Queen Anne's style into our ecclesiastical architecture, though there the models are numerous and of unobjectionable authority.

The only important national work completed during the year is the addition made by Prof. E. M. Barry, R.A., to the National Gallery. Externally, the new part makes little show, and what is seen is merely plain brickwork. But the rooms are spacious, the decorations sumptuous. If considered as merely "additions" to the existing National Gallery, the new rooms might be pronounced overwrought and incongruous. But they are really a

part of Mr. Barry's magnificent design for a New National Gallery—the north-eastern end of the original design—but considerably modified. The new building comprises an octagonal hall, which forms the centre of a cross, the four equal arms serving as vestibules, which lead respectively to the new East and North Galleries, and to the saloons of the older gallery. The Central Octagon has a dome and lantern elaborately decorated, columns of dark green marble, with gilt Corinthian capitals, and a floor of marble inlay. The walls are of crimson, on a plinth of black marble. The cornice is richly gilt, the frieze, instead of ornament, has a mysterious motto, which has the peculiar demerit of being at once obscure in expression, doubtful in principle, and faulty in grammar. From the capitals spring semi-circular arches, in the spandrils of which are busts of Michel Angelo, Raphael, Titian, Rembrandt, Hogarth, Reynolds, Gainsborough, and Turner. The East Gallery is a noble room, 100 feet by 40 feet; the North Gallery is still larger, being 120 feet by 40 feet; the North East Gallery, which connects the two, is 40 feet square, and has the angles cut off, much to the improvement of its appearance. All are alike in general character and richness of decoration; have plinths of black marble, a somewhat elaborate frieze, coved roofs and flat glass ceilings. The walls are a deep crimson, and gilding is very freely, but not obtrusively, employed. The rooms are well arranged, have undoubtedly a magnificent effect, and, architecturally, are worthy of all the praise they have received. But as galleries for the display of pictures we cannot regard them as perfectly successful. Their splendour diminishes the effect, and their size dwarfs the proportions of the pictures. For altar-pieces and "gallery paintings" large rooms are requisite, but pictures of the cabinet size, like the majority of those in the National Gallery, are seen to much greater advantage in rooms of a more moderate size. The proper course for a National Gallery so extensive as ours, and likely rapidly to increase in extent, would be to have a few large saloons for the larger paintings, and a great many small rooms for those of smaller dimensions. This would allow of a comparatively strict arrangement of the pictures in schools, and, to a certain extent, of a chronological arrangement also—the advantages of which for students' purposes are indisputable—as well as of occasional revision of the hanging, and the admission in suitable places of new pictures: all of which is impossible as the rooms now are, and would be very difficult, if not impracticable, if the entire gallery were rebuilt to accord with the new rooms.

Extensive alterations are in progress at the British Museum, but full effect cannot be given to the proposed modifications until the completion of the Museum of Natural History at South Kensington permits the removal of the collections of natural history, and the rearrangement of the other collections.

The works at the Museum of Natural History are making steady, and, as far as they have gone, satisfactory progress. Scientific authorities seem generally to approve of the plan and

departmental arrangements, which appear to have been carefully considered. The various details are admirably executed, and the general effect promises to be excellent. The grander ornamental features of the exterior, which the architect thought absolutely necessary to the artistic effect, it will be remembered, were ruthlessly cut away by Mr. Ayrton, when he was Commissioner of Works, but now that he is happily removed it is to be hoped they will be restored. If the building is completed without them, the vast exterior will undoubtedly appear somewhat monotonous, despite the richness and novelty of the details. They may not be structurally necessary, but they would greatly enhance the character and importance of the building, and small parsimony in a national work of such magnitude is unworthy of the dignity, and would be a discredit to the taste, of the country.

The New Law Courts appear to be advancing with as much rapidity as is desirable in a building of such magnitude and importance. The eastern block, a building distinct from, though a part of, the main building, has been carried up to the fifth storey, whence the tall roof is to spring. It is of stone towards the Strand, of brick on its northern side, and comprises the apartments for "Judges at Chambers," and other judicial offices. The plan of the main building is now fairly developed. The grand south entrance facing the Strand, with its octagonal flanking towers 90 feet apart, and magnificent recessed archway, and outline of the stately hall beyond, can be clearly made out. The contract for the east building is to be completed by August, 1877 ; that for the main building by the close of 1880.

The intention of erecting a new Mint on the Victoria Embankment seems to have been definitely abandoned by the Government. We have not heard that another site has been selected.

The statue of the Prince Consort now occupies its place under the tabernacle of the Albert Memorial, and the memorial itself is completed. The memorial has been fully described in preceding years. Its magnificence can now only be fully appreciated. The statue of the Prince, Foley's last work, is of colossal size, seated ; and statue, chair, and plinth are heavily gilded. In its freshness the effect is not agreeable. The features cannot be properly seen ; the glittering surface is destructive of repose and dignity ; the seated position, the bending forward of the upper part of the body, the prominence given to the advanced right leg, have an ungraceful aspect when the statue is looked at from below, the only place from which it can be fairly seen. The statue of the Prince Consort, executed by Mr. Foley, for the University of Cambridge, has also been completed, and erected in the Senate House. It is of marble, happily not disguised by barbaric gold, and appropriately enough, considering the position it is to occupy, represents the Prince in his robes as Chancellor of the University.

The Wellington Memorial, in St. Paul's Cathedral, is advancing, though slowly, towards completion. The parts are fine,

how the whole will look, in reference to its purpose and position, can only be judged when everything is in its place. In the Dean's Aisle of St. Paul's, an elegant sarcophagus has been erected from the designs of Mr. F. C. Penrose, surmounted by a recumbent statue of the late Dean Milman, by Mr. F. J. Williamson. The statue is a creditable work of art, and a good likeness of the estimable poet and historian.

At Manchester, a memorial statue has been erected of Oliver Cromwell. It is placed close to the Cathedral, to which the great Protector was not supposed to be a warm friend, is of bronze, 9 feet high, and stands on a pedestal of rough-hewn granite. Cromwell is dressed as he may have fought at Naseby, and is not without a certain rude strength and energy, but the sculptor, Mr. Noble, was hardly qualified to deal properly with a hero of Cromwell's calibre. The statue was given to the citizens by Mrs. Heywood, in fulfilment of the wishes of her late husband, Alderman Goadsby, who presented the city with its memorial statue of the Prince Consort. Mr. Noble's bronze statue of Sir Robert Peel, for Westminster, has been cast and is ready for erection.

A marble statue, by Signor Fontana, of the late S. R. Graves, M.P. for Liverpool, has been erected in St. George's Hall, in that town. Halifax has set up the effigy of its living representative, Colonel Edward Akroyd. The statue, which is of bronze and of heroic size, was designed by Mr. J. B. Philip, and, after his death, completed by Signor Fucigna.

A marble bust of the late Charles Kingsley, by Thomas Woolner, R.A., has been erected in Westminster Abbey; and one of Edward Gibbon Wakefield, by Joseph Durham, A.R.A., in the corridor of the Colonial Office.

The erection of the memorial to Thomas Clarkson, at Wisbeach, a tabernacle cross, designed by Sir G. G. Scott, has been delayed owing to some difficulty respecting the site. A somewhat similar memorial is proposed to be erected at Newbury, to Lucius Cary, Lord Falkland, who was killed near that town, September, 1643, but we have not heard whether it has been commenced.

2.—Public and Sanitary Works.

The Metropolitan Board of Works goes on slowly but surely in developing and completing the scheme of the Thames Embankment. But with all that has been done the work wears a painfully unfinished aspect. The clearance for what is to be called Northumberland Avenue has not improved the appearance of either Charing Cross or the river side. The street itself—or avenue, if it must bear that ungainly designation—is likely to be a noble one. It is of ample width, and the trees which have been planted along it will, if they flourish, be a pleasant innovation. The official report gives the length of the thoroughfare as about 950 yards, its width 84 feet, of which the carriage-way occupies 60 feet, and each foot-way 12 feet. The amount paid by

the Board for Northumberland House was 500,000*l.*, for other property required for the improvement 80,193*l.* The construction of the street, with its subways, vaults, and wooden pavement, cost somewhat over 20,000*l.* Altogether a costly improvement; it is a pity the most was not made of it.

A new thoroughfare has also been opened to the Embankment through the Savoy; and the ground has been surveyed for the extension of the Embankment itself beyond the Houses of Parliament, so as to join the Millbank Embankment, when there will be a continuous river wall and way of nearly four miles from Blackfriars to Chelsea. At the same time it is proposed to construct a new street from Abingdon Street to the Millbank Penitentiary. With the important new thoroughfare from Oxford Street to Shoreditch considerable progress has been made, and some portions have been completed and opened for traffic. In connection with it a new street has been formed from Tabernacle Square to Shoreditch, opposite Commercial Street. Other street improvements are in hand, and altogether the Board is undoubtedly doing much good work, and assisting other bodies in doing more.

The Public Health Act, 1875, and the Act for the Prevention of the Pollution of Rivers are calculated to effect great sanitary benefits. The latter Act was altered in passing through the Houses in the interests of the manufacturers, but by no means in the interest of the public. But though its benefits will in many localities be deferred in consequence, the gain is unquestionable and substantial. Many urban authorities are already taking measures for carrying out the intentions of the legislature; Bradford, for example, has undertaken to spend 200,000*l.* for a new reservoir, and Lincoln, Leeds, and other places have entered into heavy engagements for sewerage works and improving the water supply, and other towns are ordering preliminary surveys and inquiries. The difficulties in the way are undoubtedly very great. No satisfactory and economical mode of disposing of town sewage by sewage farms and irrigation or filtration has yet been brought into operation; chemical processes fail to purify the effluent water, and yet, most properly, towns are now prohibited from discharging their refuse matter into what they have hitherto considered to be their natural outlets, the streams. In villages the difficulty is equally great, the necessity equally urgent, of providing a sufficient supply of wholesome water. The horrors of the actual water supply of our villages are a national scandal.

The Artizans and Labourers Dwellings' Act has as yet borne no material fruit in the metropolis, the trumpery scheme put forth by the Metropolitan Board of Works having been summarily set aside by the Home Secretary. But one or two parishes have taken the initiatory steps, and no doubt by next year some actual progress will have been made. Meantime several of the provincial towns have resolved to adopt the provisions of the Act, and Birmingham has set a noble example to London by

the adoption of a scheme that, in its breadth, liberality, and comprehensiveness, is a model which the Metropolitan Board will do well to study.

Looking at what has been accomplished in providing improved dwellings for artizans, &c., we notice with pleasure the continued progress of the Peabody Fund Buildings. Several new blocks have been opened, and twelve new blocks of 200 tenements in the Grosvenor Road, Pimlico, are nearly completed. When these are opened the trustees will have provided improved dwellings for about 2,000 families, at rents averaging 4*s.* a-week for each tenement. In the household and sanitary arrangements of the more recent buildings the trustees have profited by experience, and the buildings generally are exceptionally healthy, few cases of infectious disease occurring in them, and the death rate being much below the average. The Improved Industrial Dwellings Company have also greatly extended their operations. Their large new blocks of buildings in the Goswell Road are very superior structures. They have now about 3,000 tenements. The Model Lodging Houses Association aims to supply the necessities of a lower stratum of society, and is, we believe, doing good service. Industrial dwellings have been built, and others are building, in many country towns.

In another direction we may notice the very commendable effort made by the Fishmongers' Company, who have built ten substantial and well fitted blocks of dwellings, providing tenements for 80 families, on their estate, Lock's Fields, Walworth, a locality where such dwellings are much wanted. The rent is fixed at a rate calculated to afford a fair interest on the outlay, which was about 13,000*l.*

The block and flat system is extending in London. Near the "Elephant and Castle" in the New Kent Road, some large blocks have been constructed, with a view "to meet the requirements of families of the middle classes," that is, of persons who can afford to pay from 10*s.* to 20*s.* a-week for a set of rooms. The buildings, which are a private speculation, will, when all are erected, cover an area of four acres, be four storeys high, have an elevation of 60 feet towards the Kent Road, with bay windows and balconies, and provide dwellings for nearly 600 families. The interiors are said to be fitted with every household and sanitary convenience; the windows have Venetian blinds, and gas is laid on to the uppermost rooms.

More remarkable than these are the Queen Anne's Mansions, Bird-cage Walk, St. James's Park, a block of improved "dwellings," erected for those, whether heads of families or bachelors, who can afford to pay a rental of £100 a year and upwards for a suite of rooms, and combining therewith, by means of co-operative housekeeping, the comforts and advantages of a club-house or hotel. The building, with little pretension to external elegance, is some ten storeys (116 feet) high, with wings, eight storeys (100 feet) high, and provides over 200 distinct dwellings, the

upper floors being reached by hydraulic lifts. Each floor contains three suites of dwellings, each having two living rooms and a bath room. Each dwelling is distinct, but two or three (the whole floor) may be hired by one tenant. Servants are supplied by the establishment, and charged for at the rate of 1*l.* a week for each dwelling. All cooking is performed in the central kitchen, whence tenants are supplied with meals at cost price either in their private sitting rooms or in the general dining or coffee room. Trams run from the kitchen to the service lifts, and there is a hot plate on each floor, so that the dinners are served more quickly and better than in most great hotels. Besides the grand coffee room there are drawing rooms, reading rooms, galleries, vestibules, a telegraph office, and every modern convenience, and to crown all, the roof is flat, and affords an almost unrivalled view over London and its suburbs, to the Surrey Hills in one direction, and Highgate and Hampstead in another. A tower at one angle, with a belvedere 150 feet high, will afford a still wider prospect. The ground floor is to be let as chambers or offices for professional persons.

Baths and washhouses have been built, or are in process of erection, in Peckham, St. Pancras, and other metropolitan parishes, and in some provincial towns. At Rugby Dr. Jex-Blake, the head master, has constructed a swimming bath at a cost of 3,000*l.*, as a gift to Rugby School. A better present could hardly have been made. The number of deaths by drowning of persons unable to swim, reported in the newspapers during the summer months, is quite horrifying. All boys ought to be taught to swim, and it is most discreditable to those who have the training of boys that the art of swimming is so generally neglected. Every large school ought to have its swimming bath, or a place specially reserved for swimming, with a competent teacher and superintendent.

The Corporation of Birmingham having applied to Miss Ryland (the donor of Cannon Hill Park) to sell them a piece of land at Small Heath, where they were desirous to form another park; the lady declined to sell the land, but offered to present the town instead with a lease of it for 500 years, at a peppercorn rent. The estate, which is about two and a half miles from the centre of the town, has an area of 42 acres, and is beautifully wooded.

Boston Castle Grounds, Rotherham, have been leased by the Corporation, and converted into public recreation grounds of ample extent and picturesque character. Reading Recreation Ground, by the liberality of Alderman Palmer, has received an addition of 13 acres, about doubling its former extent.

At Salford, the Corporation some time since decided to form three new parks—or recreation grounds, the largest is only 16 acres in extent—in different parts of the town. Two, at Pendleton and Higher Broughton, are completed, the third, at Ordsall Hall, will, it is hoped, be ready by next summer.

3. Churches and Chapels.

In church building we are moving quietly along the old lines. Several good churches have been built, both in and around London and in the country, but none of any remarkable size, grandeur, or even novelty. It need hardly be said, therefore, that they are all Gothic, and mostly of that particular type known as First Pointed or Early English, though for these new churches the latter designation would be particularly inappropriate, as in most instances a foreign character is more or less present, and in some is predominant.

St. Mary, Newington, consecrated in April last, was built in place of the former parish church, which, from its projecting into the road, caused an awkward narrowing of the busy thoroughfare known as Newington Butts, near the Elephant and Castle. The new church stands a few hundred yards farther down the Kennington Road. It is of Kentish rag with Bath stone dressings, and comprises nave with aisles, chancel, porch, tower, and spire—the latter is yet unfinished. The nave, of five bays, is 100 feet long, 35 feet wide, and 70 feet high to the ridge of the roof. The chancel is 44 feet by 32 feet, and of equal height with the nave. It is lighted by five large lancets with a rose above, and twelve small windows on the sides—a continuation of the clerestorey windows of the nave. Accommodation is provided for 1,200 persons on the floor, and 150 children in a gallery over the porch. The cost was about 20,000*l*. The architect was Mr. J. Fowler, of Louth.

St. Agnes, Kennington, a short distance south of the church just noticed, is a somewhat ambitious edifice of brick and stone, late First Pointed in style, erected from the designs of Mr. G. G. Scott, jun. The church is 170 feet long; the nave and aisles 55 feet wide; the chancel floor is raised above the nave, and divided from it by a screen and rood loft. The walls are 48 feet high, the roof, which is half barrel shaped and boarded, is continuous over the nave and chancel, a bell gable over the chancel arch marking the division. It is proposed to decorate the interior somewhat richly, and provision is made for frescoes, &c. The tower is left for erection at a future day.

All Saints, Eden Grove, Stoke Newington, designed by Messrs. Dollman and Allen, is a late First Pointed cruciform building, of yellow brick with red and black bands and dressings of Bath stone, and comprises nave, with aisles, clerestorey, and triforium, narthex, sanctuary, and chancel. The north transept serves as an organ chamber, the south as a morning chapel. The narthex opens into the nave by an arcade of three arches. The shafts of the clerestorey and sedilia are of red Dumfries stone. The roof is barrel vaulted, and divided into panels, which are decorated in distemper with mottoes, monograms, &c. The font is suitable for baptism by immersion. A tower is to be erected, when funds are obtained, on the site of the present vestry.

St. Paul's, Central Street, Goswell Road, Clerkenwell, is a solidly built fabric of Kentish rag and Bath stone, First Pointed in style, designed by Mr. Ewan Christian. This is one of the churches built from funds obtained by the removal of City churches. The pulpit, font, communion table, chairs, bells, and royal arms, belonged to Sir Christopher Wren's demolished church of St. Mildred, Poultry, opposite the Mansion House.

St. Mary the Virgin, Crown Street, Soho, occupies the site of the Greek Church of St. Mary, dedicated in 1677. The present buildings, which have been raised by degrees as funds were obtained, comprise the church (only in part completed), clergy house (a lofty building of six storeys), and spacious schools. The church, designed by Mr. Carpenter, is First Pointed in style, of red brick, very lofty, and comparatively plain externally, but elaborately decorated within. The chancel, the part first completed, is 36 feet by 34 feet, and 60 feet high to the crown of the vault; the ridge of the roof is 80 feet high. The sills of the windows are 30 feet above the floor of the altar dais. The altar is reached by a flight of twelve steps. In the space above it is a marble statue of the Saviour. The nave, of four bays, is to be of lower pitch than the chancel and less embellished.

St. Augustine, Lynton Road, South Bermondsey, is a First Pointed building of red brick and Bath stone, designed by Messrs. Jarvis and Son, and consists of nave with aisles, narthex, and octagonal baptistery, deep chancel, and tower on the north, the basement of which is fitted as an organ chamber. Beneath the whole is a vaulted crypt.

Among the new churches in the environs may be noticed Christ Church, Beckenham, Kent, a First Pointed building of Suffolk brick and Bath stone, designed by Messrs. Blashell and Haywood. The nave piers are polished monoliths of dark Shap granite. The tower on the south-west is surmounted by a spire 117 feet high.

St. Peter's, Clapham Junction, is a First Pointed church, of coloured bricks with dressings of red brick and Bath stone. It comprises nave with apsidal west end, aisles, south chancel and aisles, organ chamber, and clergy and choir vestries, south-west tower and spire 150 feet high, and north-west porch, in a niche in the gable of which is a statue of the patron saint. The chief feature of the interior is the unusual width of the nave. The nave arcades, of five bays, are borne on clustered columns of Pennant stone surmounted by carved capitals. The arches are of moulded bricks. The roof is open timber work of massive construction. South of the chancel is the minstrels' gallery and organ loft. The pulpit and font, of pale alabaster, are elaborately carved, the work of Mr. H. Hems, of Exeter. The architect was Mr. William White.

St. Stephen, Cambridge Park, Twickenham, designed by Messrs. Lockwood and Mawson, is a late First Pointed church, with a large Second Pointed west window. It is of Kentish rag and Bath stone, and comprises nave and aisles; the chancel and spire remain for erection at a future day.

Of the country churches, precedence may be given to All Saints, Gloucester, designed by Sir G. G. Scott, R.A. It is Second Pointed in style, and noteworthy for the rich tracery in the windows, goodness of the mouldings and carvings, and careful finish throughout. It comprises nave with aisles, chancel with south aisle, clergy and choir vestries, and south-west porch. The nave, 76 feet long, 26 feet wide, and 53 feet high, has a barrel roof, boarded and panelled. The fittings are of a superior order; the pulpit and font of stone, richly panelled and carved. The chancel windows have been filled with painted glass by Clayton and Bell, at the cost of the Misses Hedley, who have also provided the communion plate and altar fittings, and contributed £2,500 towards the erection of the church.

The Church of the Holy Angels, Hoarcross, Yoxhall, near Abbot's-Bromley, Staffordshire, erected as a memorial of the late H. F. Meynell-Ingram, of Hoarcross Hall, by his widow, is noteworthy as the latest phase of a ritualistic church. The building, designed by Messrs. Bodley and Garner, is small, cruciform, with a central tower, and Second Pointed in style. It is built of a reddish-tinted stone, has much good carving, is superbly decorated, and has cost over £35,000. The chancel is cut off from the rest of the church by a high screen. The east window has its sill high above the altar, the intervening space being occupied by an elaborate reredos, carved with effigies of St. George, St. Patrick, St. Andrew, St. David, St. Uriel, and many other saintly and symbolic figures; above them the Blessed Virgin, St. Gabriel, and St. Chad. In the centre is a gilded and richly bossed cross, with, at its foot, "the pelican in her piety." Niches with figures decorate the mullions and jambs of the east window. All the windows of the chancel have painted glass, representing on one side the four Fathers of the Western, on the other those of the Eastern Church, with above them the "chorus angelorum."

The church of St. Nicholas, Guildford, erected in 1836, has been demolished, and a new one erected on the site. The new building, designed by the late Mr. S. S. Teulon, has been erected under the direction of Mr. Christian. The exterior is of Bargate stone, with Bath stone dressings; the interior is lined with brick; the piers of the nave arcades being of greystone, and those of the chancel arches and More Chapel of polished serpentine and veined marble. The extreme length (nave, chancel, and apse) is 118 feet; the width (nave and aisles) 61 feet. The lofty nave has a good roof of polished fir, the chancel has a stone vaulting. The chancel is divided from the nave by a low stone wall. The east windows are filled with painted glass. The central tower is left for the present unfinished. The ancient More or Loseley mortuary chapel has been preserved, and is apparently not seriously damaged by restoration.

The little late First Pointed church, erected by Mr. Edmund Sharpe at Scotforth, Lancaster, is worthy of notice on account of the free and apparently successful use of terra cotta as a building

material. The terra cotta, made by Messrs. Cliff from a stony shale obtained in the coal measure at Wortley, near Leeds, carefully moulded and thoroughly burned, is used not as surface decoration, but in small solid blocks built into the walls, so as, in Mr. Sharpe's words, "essentially to form part and parcel of the body and strength of the structure." The church itself is constructed of rubble walling with terra cotta dressings; the piers, with their bases and capitals, pier arches, string courses, roof shafts, corbels and capitals, chancel arches and arcade, doorways, circular and clerestorey windows, and the whole upper part of the tower, are of terra cotta. The material is of a nearly uniform warm stone colour, and good surface and texture, and works well. It allows of great enrichment at a moderate cost. Scotforth Church, with accommodation for 300, cost altogether only 2,800*l.*

With the help of the professional journals and illustrated and local newspapers, we give a list of other churches completed during the year, arranged, as in former volumes, under the First and Second Pointed (or Early English and Decorated) styles. When not otherwise stated, the churches may be understood to comprise nave, aisles, and chancel, vestry, a tower, and sometimes a spire.

Among the churches First Pointed in style are:—St. Giles *Newcastle*, on the site of the old church, large, light, and lofty, the chancel arch being 45 feet high and 24 feet wide; architect, Sir G. G. Scott, R.A. St. John Baptist, *Swalecliffe*, Kent, on the site of a former church; a neat little building, designed by Mr. R. Wheeler, of Tunbridge Wells. St. Margaret, Ladywood, *Birmingham;* has nave and aisles, apsidal chancel, baptistery, organ chamber, and west porch; of red brick and stone; 720 seats; architect, Mr. F. B. Osborn. St. Peter, St. Mary's Hill, *Tunbridge;* architect, Mr. E. E. Cronk. *Longhirst*, near Morpeth; cruciform, with tower and spire 100 feet high. St. Catherine, *Canvey Island*, Essex; on site of former church; cruciform; Mr. F. G. Lee, architect. St. Luke, *Burton*, near Christchurch, Hampshire; cruciform, but chancel and other parts are left for completion when sufficient funds are obtained; architects, Messrs. B. and E. H. Ferrey. St. James, *Bix*, Henley-on-Thames; erected on the site of the old parish church, at the cost of the Earl of Macclesfield; architect, Mr. J. Gibson. St. Andrew, *East Allesley*, near Coventry; of red brick and Bath stone; 150 seats; cost of church, parsonage, and school for 70 children, 6,300*l.*; architect, Mr. S. S. Teulon. St. Mary and St. Helen, *Neston*, Cheshire; of local red sandstone, with freestone dressings; 700 seats; cost 7,000*l.*; architect, Mr. F. Doyle, of Liverpool. St. Aidan's, Kirkdale, *Liverpool;* architects, Messrs. Culshaw. *Old Malden*, Surrey; red brick and stone; architect, Mr. T. G. Jackson. *Marston Maisey*, on the site of an older church; a pretty little building, designed by Mr. J. Brooks, comprising only nave and chancel, and providing in both only 110 seats. St. Luke, *Dudley;* architects, Messrs. Davies

and Middleton. *Laxton*, near Howden, Yorkshire, in place of a 17th century church which stood on the other side of the road. St. Saviour, *Tunbridge*, Kent, a chapel of ease, erected from the designs of Mr. Ewan Christian, at the cost of Mr. Deacon. *Speke*, near Hale, Lancashire; erected at the cost of Mr. Sprot; of hammered stone; tower and spire 105 feet high, and good peal of bells; architect, Mr. Pearson. *Hartfordbridge*, near Odiham; architect, Mr. George Birch. *Llandyfeisant*, on the Towy, Carmarthen, on the site of the old parish church; the new church, "in every respect a plain building," was designed by the Rev. Mr. Wigan, of Gloucester. St. Mary, *Willington*, on the Tyne; 300 sittings; cost 2,700*l.*; architects, Messrs. Johnston and Austin, Newcastle-upon-Tyne. St. Paul, *Gatten*, near Shanklin, Isle of Wight; the portion built at present provides 370 sittings, but when completed there will be room in the church for over 700; architect, Mr. C. L. Luck.

In the Second Pointed style, the following churches have been completed:—St. John the Evangelist, *Apsal Close*, near Mildenhall, Suffolk; of flint and stone, with bands of red brick, and open timber roof; has south transept and porch, and wooden bell turret; architect, Mr. J. D. Wyatt. St. Mary, *Oldeborrow*, Worcester, on the foundations of the old parish church, the tower and spire of which have been preserved; architect, Mr. T. Garner. St. Hilary, *Spridlington*, on the site of a dilapidated 15th century structure; architect, Mr. J. Fowler. *Semley*, Wiltshire, erected on the site of the old parish church, at the cost of the Marchioness of Westminster; of local stone, with Bath-stone dressings; some excellent carved work, and the whole carefully finished; architect, Mr. T. H. Wyatt. Christ Church, *Marton*, near Boroughbridge, on the site of the old church; 122 seats; cost 1,700*l.*; architect, Mr. J. Ladds. Holy Trinity, *Dorchester*, Dorsetshire, on the site of the old church, but larger and richer in detail; of local stone, with Portland, Bath, and Corsham stone dressings; architect, Mr. B. Ferrey, F.S.A. Holy Trinity, *Old Hill*, Rowley Regis; a large cruciform pile, with tower at the south-east 110 feet high, containing a peal of eight bells; 1,000 seats; cost 11,500*l.*; architect, Mr. J. T. Meredith, of Kidderminster. *Atherstone-on-Stour*, near Stratford-on-Avon, on the site of the old parish church, which had become too dilapidated for repair; of local stone, with Bath and Campden stone dressings; architect, Mr. J. Cotton, of Birmingham. St. James, *Darlington*; cruciform, with apsidal chancel, and tower and spire at the south-east, 148 feet high; 500 seats; cost 4,500*l.*; architects, Messrs. Ross and Lamb. *Ayott St. Peter*, Herts, in place of the old church destroyed by lightning, July 10, 1874. The little church comprises nave, apsidal chancel, tower and stone spire on the south-east, and north porch. There is some good carved work, and the chancel is elaborately decorated in colours, but the special feature is the chancel arch, which is of artificial coloured (Gris de Flandre) stoneware. The architect was Mr. J. P. Seddon.

If there has been any slackening in the building of new churches, it has been more than compensated to the church architect by the still increasing activity in church restoration. And this compensation is of a twofold kind. Besides the most obvious and main one of ample and profitable employment, there is another, that every church restoration removes one more testimony against the poverty and feebleness of the new work. From England, at least, all true old Gothic architecture is being rapidly swept away, and a spurious second-hand nineteenth century contractors' Gothic substituted for it. If here and there an untouched fragment be left, it is so mixed up with renewed and rechiselled work, that great difficulty will be found in distinguishing it, even by the expert, whilst to all others it will be indistinguishable and untrustworthy. However, we shall have instead a superabundance of imitation Gothic, which, if not the real thing, is newer and brighter, some say "looks as well or better," and if destroyed or damaged can at any time be replaced without difficulty, in any quantity and on the shortest notice.

At Salisbury Cathedral the process of restoration has been steadily continued, and is now so far advanced that the choir was reopened with special services on the 1st of November, when the magnificent reredos, erected at the cost of Earl Beauchamp, was uncovered, and the organ (by Willis), given by Miss Chafyn Grove, was opened. The transepts are nearly completed, and it is proposed next to restore the nave. This is estimated to cost about 6,000*l.*, towards which the Dean has offered to contribute 3,000*l.* The expenditure up to the present time has been about 50,000*l.* The floor of the choir has been repaved at its original level with marble inlaid work. The choir is being coloured and decorated upon an elaborate system, on the success of which, as might be expected, opinions differ widely. The roof is very elaborately decorated. In the centre is a Majesty; westward are effigies of saints; eastward representations of the months; the theory being that the high altar was placed under, or immediately behind, the Majesty, and hence the secular character of the paintings eastward of it. In the course of the works a late Third Pointed screen, consisting of a series of niches, was discovered between the piers of the south arcade of the choir. It had been built over by a plain wall. This has been cleared away and the screen restored.

But the work of renovation has been still more thorough at Chester than at Salisbury. At Salisbury the exterior appearance has not been materially altered. At Chester its whole aspect has been transformed; the external surface has been almost wholly renewed; the window tracery is changed; the parapets are fresh and in good part new; the gables have received tall finials; the stern old tower has been lightened by the addition of turrets and pinnacles, and the old Third Pointed east end of the choir has given way to a strange pyramidal First Pointed apse, for which the architect is said to have found sufficient evidence, but

which appears quite out of keeping with the rest of the building. The interior, having suffered less from atmospheric action, has been less changed in the restorative process, and the alterations which have been made do not produce the same appearance of novelty, and consequently meet with more general approval. The external transformation has been so great as to take away for the present the air of hoar antiquity which was so marked a characteristic—and in truth the chief redeeming feature—of Chester Cathedral, and it now wears very much the ordinary aspect of a modern antique. The substantial work has, however, been thoroughly well done, and the fabric is as strong and sound as at any period of its existence. The amount expended on the restoration has been over 80,000*l*. Sir Gilbert Scott wishes, it is said, to erect a lofty wooden spire on the central tower, but this is strongly objected to by many, and has not as yet we believe, been decided on.

The restoration of Durham Cathedral, which has been for so many years in progress, is approaching completion. The work of restoration has culminated in the choir, which has been thoroughly replenished, and fitted and furnished with great splendour. So costly, indeed, have the works been, that the Bishop of Durham, when requested to preach the sermon at the re-opening of the cathedral, refused to do so, as he "cannot consistently take part in a service to inaugurate the completion of the recent alterations," when he has "frequently expressed his regret that these alterations have been undertaken," or give his "countenance to an expenditure of church funds which, in his judgment, has been unwise and wasteful." When we last saw Durham Cathedral the choir was in too chaotic a state to judge fairly of the alterations, but from what we saw and have since heard, and the accounts we read of the elaborately carved new First Pointed choir screen of alabaster and polished marbles, the bright brass railings, pulpit, pavement, and painted glass, and the rechiselling of the marvellous old pillars, we cannot but fear that a terrible inroad has been made on the sombre majesty of this grand old cathedral, in its way unique among the cathedrals of England.

The works at Bristol Cathedral were suddenly suspended last spring, the restoration committee having resigned in consequence of the Dean of Bristol having ordered the removal of certain sculpture on the newly erected north porch. These figures were the Virgin and the four great doctors of the Latin church, Saints Augustine, Jerome, Ambrose, and Gregory. Exception was particularly taken to the figure of St. Gregory, he being represented as wearing a tiara, and bearing a curiously close resemblance to the figure of Pope Gregory, recently placed in the neighbouring Roman Catholic Cathedral at Clifton, but, as the Dean alleged, in all had been "introduced accessories having no connection with the subject, in order to flaunt in our faces the ecclesiastical claims and teachings" of the Romish Church. Of this sort of thing far too much has been introduced in church restorations to accord

with even the lowest notions of plain dealing, and it is well that such proceedings should receive a check. But it is greatly to be regretted that the occasion should have arisen in connection with Bristol Cathedral. The rebuilding of the nave is so good a work in itself, and we hoped so much from Mr. Street's Gothic genius, that we cannot but regret that anything should have occurred to delay the completion of the work. An effort is being made to carry on the building under other auspices—but still under Mr. Street's supervision—and we trust it will be successful.

The choir and chancel of Bangor Cathedral being completed, an effort is making to ensure funds for restoring the nave, completing the tower, and rebuilding the chapter house, all of which, Sir Gilbert Scott estimates, may be accomplished for 12,000*l*.

The noble minster of Southwell has been restored, under the direction of Mr. Ewan Christian, but now a grave difficulty has interposed in respect of the internal arrangements. The main obstacle is as usual the screen. At Southwell, this is a tall solid wall of masonry, some 15 to 20 feet deep, which virtually divides the building into two churches. Some ecclesiastical authorities wish the building to be kept as it is; the clergy sitting in the choir, the laity in the nave, and the screen being converted into a "chorus cantorum," seen and heard by both congregations. The parochial feeling inclines to the removal of the screen, and the union of choir and nave into one great parish church. The third plan, and that which seems best to satisfy at once artistic feeling and congregational convenience, is to maintain the screen intact, and to treat choir and nave as two distinct churches, employing the choir for morning and collegiate services, and occasions when the attendance would probably be small, and reserving the nave for ordinary Sunday and parochial services.

The works at St. Alban's proceed, but seemingly with some little abatement of zeal, or probably it is merely a waiting for the quickening movement of a decision respecting the nem see Tewkesbury Abbey Church, hardly inferior in interest to St. Alban's, is also under Sir Gilbert Scott's restoring hand, and like St. Alban's, the work is impeded by insufficiency of funds.

Among the dissenting bodies, the Congregationalists and Wesleyan Methodists maintain the greatest activity in church building. One of the more noteworthy suburban Congregationalist churches opened in the year, is at Anerley, by Sydenham. It is a Romanesque building of red and white brick, and Bath stone, 130 feet long, 56 feet wide, and 41 feet high, with the roof in one span, has an angle tower and spire 159 feet high; sittings for 780 on the ground floor, and 510 in the galleries; and cost 12,500*l*. The architects were Messrs. Elkington.

Christ Church, Chase Side, Enfield, is a cruciform Gothic structure, of brick and Bath stone, with nave, aisles, narthex, double transepts, chancel, and apsidal sanctuary, and a tower and spire 160 feet high. Behind the altar is a reredos, on which is an alto-relievo of the Last Supper, by Sansom. Messrs. Tarring were the architects.

The Tynedale Memorial Chapel, Gloucester, is a First Pointed building of Painswick stone, lined with brick, with accommodation for 700 persons. The principal external features are the deeply recessed doorway, and a tall slender flèche. It was designed by Mr. Tait, of Leicester.

At Wellingborough, a Gothic church, with the peculiarity of being elliptical in plan, has been erected from the designs of Mr. E. Sharman, of Wellingborough. The building is of Dunster stone, with Bath stone dressings, and red Mansfield stone shafts to the columns. The carving, which is in more than usual quantity, was executed by Mr. H. Hems, of Exeter. The plan and all the arrangements are studiously adapted to the Congregational mode of worship, and the church is said to be, from that point of view, very successful.

Congregational churches and chapels have also been erected at: *Skipsea*, Bridlington; architect, Mr. Scott. *Westborough*, Maidstone; of Kentish rag and Bath stone; Gothic; architect, Mr. Portwee, of Chelmsford. *Wickford*, Essex; architect, Mr. Portwee. *Hatfield Heath;* of flint and stone; Gothic; 450 sittings; cost 4,000*l.*; architect, Mr. Banks. *Worksop;* Gothic; 450 sittings. *Matching Tye*, Essex; architect, Mr. G. Perry, of Bishop Stortford. *Little Horton*, near Bradford, Yorkshire; Italian in style, with campanile 60 feet high, at the north-west angle; architects, Messrs. Healey. *Newton Abbot*, Devonshire; Early Second Pointed; of local grey limestone with Bath stone dressings; massive tower at the west end, on which is to be raised a spire 150 feet high; architect, Mr. J. W. Rowell. Carmarthen Road, *Swansea;* of local stone, with Bath stone dressings; architect, Mr. Williams. *Weston-super-Mare;* Second Pointed in style, cruciform, and thoroughly orthodox, having nave with aisles, narthex, chancel, and transepts. From the intersection of the arms of the cross rises a slender flèche. The church has 800 sittings, and cost about 7,000*l.*

At the last Wesleyan Conference it was reported that, during the past year, 271 chapels, ministers' houses, &c., had been completed at a cost of 345,595*l.*; and that 393 erections and enlargements had been sanctioned by the chapel committee, and were now in progress towards completion, at an estimated cost of 353,112*l.* Few of the chapels are of any distinctive architectural value. Among those round London may be noticed a spacious Italian structure, in the Seven Sisters' Road, Finsbury Park, designed by Mr. F. Boreham, for a congregation of 1,000; and a Gothic building, of Kentish rag and Bath stone, for 1,060 persons, erected at Ravenscourt Road, Hammersmith.

Wesleyan Methodist chapels have also been built, among other places, at *Silloth;* Gothic; of red brick and stone. *Hatfield Peveril*, Essex; Gothic; 230 sittings; architect, Mr. A. C. Lewis, of Woodford. *Ocker Hill;* Grecian; 550 sittings; cost 2,000*l.*; architects, Messrs. Saxton, of Wednesbury. *Roade*, Northampton; of red brick and stone; architect, Mr. S. J. Newman, of Northampton. *Malpas*, Cheshire; of brick and

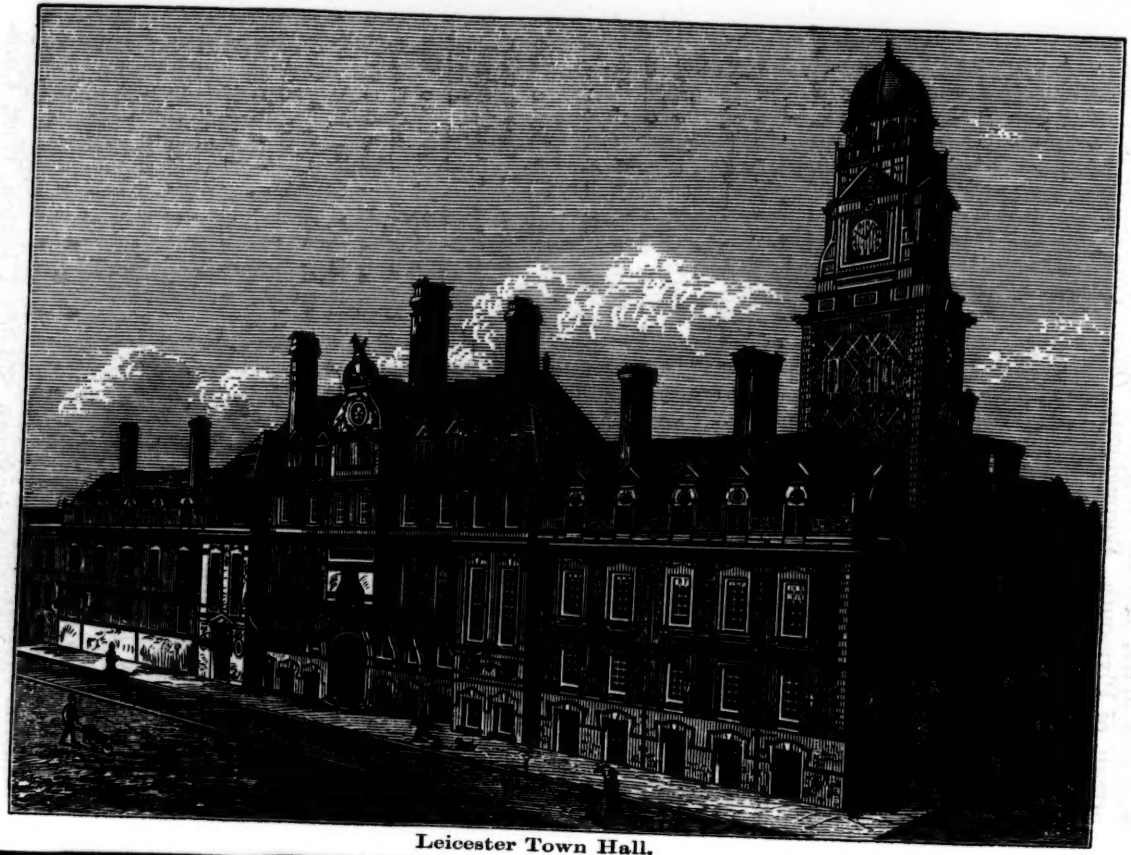
stone; Gothic; designed by Mr. J. Rogers. *Hillsborough*, Sheffield; Gothic; 520 sittings; cost 3,000*l.*; architect, Mr. Webster. *Ivy-bridge*, Devonshire; First Pointed in style; cruciform, with a tower and spire, 100 feet high; architects, Messrs. Hine and Norman, of Plymouth. Boroughgate, *Otley*, Yorkshire; of Horsforth stone; Italian in style; 1,000 sittings; cost 6,800*l.*; architect, Mr. E. Taylor, of York. *Chattisham*, Suffolk; architects, Messrs. Cattermole and Eade, of Ipswich. *Langton*, Dorsetshire; First Pointed; of Purbeck stone; 250 sittings; architect, Mr. J. Wills, of Derby. *Coniston*, Lancashire; First Pointed; of local blue stone; architect, Mr. Eli Cox, Kendal. Wells Memorial Chapel, *Eckington;* Grecian in style; of dressed stone; 700 sittings; cost 4,000*l.*; architect, Mr. J. H. Kent, of Chester. *Barnton*, Cheshire; Decorated; of coloured bricks and stone; 350 sittings; architect, Mr. H. J. Bennet, of Norwich. *Woodhouse Moor;* a spacious Gothic edifice, with accommodation for a congregation of 1,100; erected from the designs of Mr. C. O. Ellison, of Liverpool, at a cost of about 11,000*l.*: and others at *Moreton Corbet*, near Shawsbury; 250 sittings; *Eastbury;* designed by Mr. Bew; *Little Thurrock*, Essex, &c.

Primitive, New Connexion, and other Methodist bodies have also built a great many chapels, but none that call for specification. Baptist, United Presbyterian, Catholic Apostolic, and Unitarian churches have also contributed, more or less liberally, to the ecclesiastical architecture of the year.

The Roman Catholics have been very busy, but they have the habit of leaving their churches incomplete. Some of those consecrated or on hand are important structures, as the Cathedral, Clifton; the Jesuit Chapel of St. Aloysius, Woodstock Road, Oxford, with chapels to Our Lady and St. Joseph, and to the Sacred Heart; St. Catharine of Sienna, Birmingham, internally a rather splendid structure, but as yet only a torso; the convent and church of St. Joseph, at York, a sufficiently grim pile, by Mr. Goldie; the monastery of St. Joseph, Highgate, a very peculiar edifice; the church of St. Margaret, Barking Road; both designed by Mr. F. W. Tasker; the church of the English Martyrs (*not* those of Mary's reign), by Messrs. Pugin; St. Joseph's, Havant, designed by Mr. J. Crawley; St. Lawrence, Park Street, Birkenhead; St. Mary, on the East Parade, Bradford, a very large but incomplete structure, designed by Mr. Simpson; St. Werburgh church and Franciscan monastery, Chester, designed by Mr. J. J. O'Byrne, of Liverpool; St. Edward, King and Confessor, Sutton, by Guildford, Surrey, a First Pointed memorial church, founded by Miss Salvin, and designed by Mr. C. Buckler; and others at South Shields, Ukeston, West Cornforth, West Grinstead, and elsewhere.

4. Buildings for Public Purposes.

The most important of the new municipal buildings, the Manchester Town Hall, or as it is now proposed to name it, the City



Leicester Town Hall.

Hall, is progressing steadily, but without undue haste, towards completion. Its admirable arrangement, magnitude, grandeur, and picturesqueness, are making themselves the more felt as the building advances, and the tower and spire, which it will be remembered will be nearly 300 feet high, are becoming noteworthy features from many parts of the city. The architect, Mr. A. Waterhouse, was also the architect of the Assize Courts.

As an example of what is being done this way in towns of smaller size, we give an engraving of the Town Hall, Leicester, opened in August last, from an excellent photograph taken for us by Mr. T. Johnson, of Leicester. The building is of Suffolk brick and Ketton stone, and, as will be seen, is in one of the varieties of the popular Queen Anne's style. It is of considerable extent, the principal front being 216 feet long, and from 60 to 80 feet high; the depth is 118 feet. The façade comprises a centre, slightly advanced, and long wings. In the centre is the chief entrance, with a recessed window and balcony over it, whence official announcements, and electioneering and other speeches may be made, and it rises into a great terminal gable, in which are carved the borough arms. The marked features of the façade are the long array of windows, the bold cornice over the principal floor, and the gabled dormers and chimney shafts which break the monotony of the tall heavy roofs. The massive clock tower on the right, 145 feet high, is also an important feature in the composition. Taken as a whole, the exterior may be regarded as in its way a really successful work; it is a great addition to the architecture of this rapidly improving town, and honourable to the architect, Mr. F. J. Hames.

Leicester Town Hall.

The interior provides sufficient, and it is said very convenient accommodation for judicial as well as municipal purposes; the judicial section being the more imposing, the municipal the most adorned. On the judicial side are assize courts, judges' rooms, borough courts, police courts, and a handsome suitors' hall, 34 feet by 20 feet, lofty, solidly fitted, and having the windows filled with painted glass, portraying Simon de Montfort, Bishop Latimer, and other distinguished personages historically associated with the town, popular mayors, and eminent benefactors. On the municipal side are the Mayor's parlour and private rooms, council chamber, town clerk's and corporation offices, school board rooms and offices, and on the second floor a large club or commons room, 68 feet by 32 feet. The most richly ornamented room is the Council Chamber, which is 56 feet by 32 feet, semi-circular in plan, with an elaborate plaster ceiling, on which are represented the borough arms, and various floral scrolls and grotesque forms. The walls are decorated with portraits and paintings brought from the old Town Hall.

A handsome suite of Municipal Buildings has been opened at Reading. They were designed by Mr. A. Waterhouse, are of the local grey brick, red terra-cotta, and stone, Gothic in style; are not large and not overloaded with ornament. The chief external feature is the tower, which to the finials is about 100 feet high. In it is

a carillon of bells set to play 28 popular national airs. Of the interior, the chief feature is the Council Chamber, which is 36 feet by 25 feet, and 24 feet high, has a coved ceiling, long gallery, and is handsomely fitted.

Assize Courts have been erected at Nottingham, from the designs of Mr. Sanders, which are described as rather convenient than ornamental, and a Town Hall at Tregaron, which does not appear to be remarkable for either quality, but for this the architect was not to blame, as no architect was employed. Hartlepool has built an Exchange, from the designs of Mr. G. G. Hoskins, which may be cheerful enough within, but is very gloomy without —in aspect something between a prison and a monastery. At Dorchester, the corporation buildings have been remodelled and enlarged under the direction of the borough surveyor, Mr. Norman, and their general appearance decidedly improved. At Rhyl, a Town Hall, with markets attached, has been built from the designs of Mr. Turner, of Manchester.

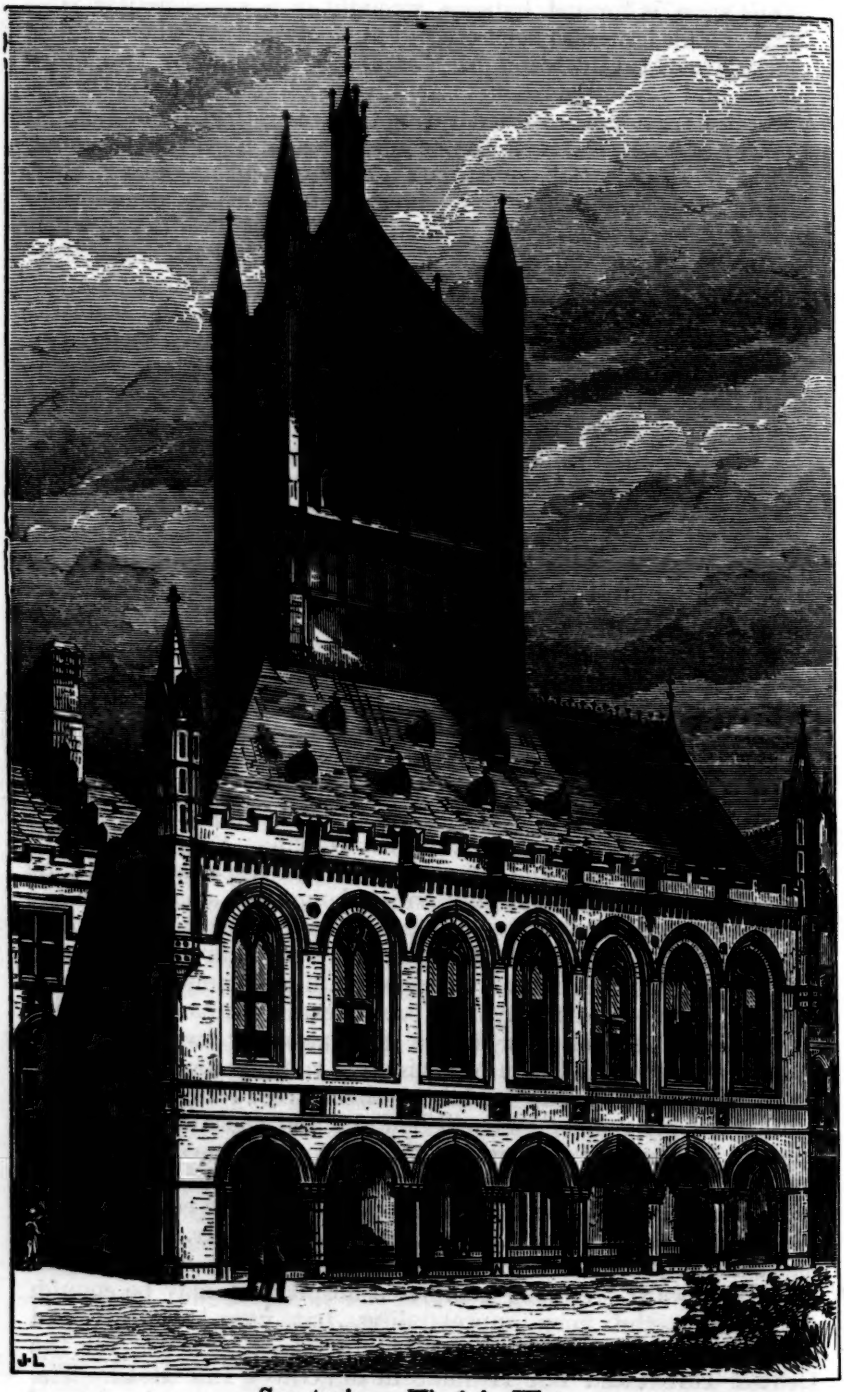
A spacious Miners' Hall has been erected at Durham, from the designs of Mr. T. Oliver, of Newcastle-on-Tyne. It is an Italian building, with a tall octagonal clock-tower at the north-west angle. The hall, 55 feet long, 32 feet wide, and 22 feet high, has a platform at one end, and a gallery at the other. The new Public Hall, Tunbridge, Gothic in style, designed by Messrs. Cattermole and Eade, has a frontage of 64 feet, and a clock-tower at the end, 74 feet high. The hall is 69 feet by 39 feet, and will accommodate 800 persons. Cambridge Hall, Southport, Lancashire, is a large and showy structure, built next the Town Hall, in order to afford the inhabitants and visitors in this flourishing young watering place a larger public hall than they have hitherto possessed. The building, which was designed by Messrs. Maxwell and Tuke, to whom has been entrusted the general scheme of town improvements, is faced with stone, and has a large carriage portico, and very conspicuous clock-tower. The hall, or assembly room, on the first floor, is 120 feet long and 50 feet wide, and has galleries carried from the walls on cast-iron brackets. The entrance hall, on the ground floor, is 55 feet by 25 feet.

At Camberwell a Vestry Hall has been erected from the designs of Messrs. Pain and Clark, and adjoining it, and forming in effect a portion of the building, a Masonic Hall, the principal external feature of which is an octagonal tower and dome 50 feet high. Greenwich has built Public Offices of considerable architectural pretension. The main feature of the exterior is a central clock-tower with dome and lantern. The entrance is by a semi-circular portico. The interior is appropriated as offices, with the exception of the board-room, 57 feet by 40 feet, and 22 feet high. The architect was Mr. Wallen.

The new Corn Exchange, Cambridge, one of the largest in the country, is a Venetian Gothic edifice of Cambridge brick and stone, designed by Mr. R. R. Rowe, of Cambridge. The Corn Hall is 163 feet by 55 feet, with a transept 48 feet by 30 feet. The roof,

in one span, is formed by nine wrought-iron semi-circular ribs. Market halls have also been erected at Goole and elsewhere; cattle markets at Middlesborough, Monmouth, and one or two other places, and vegetable markets at Liverpool, &c. The most important market house opened during the year is the City of London Poultry Market, but as it has been noticed in a previous volume, and is in all essential particulars a copy of the adjoining Meat Market, it is unnecessary to do more than record its completion. It is to be supplemented by a Fruit and Vegetable Market, when the whole is to be entitled the Metropolitan Markets, and will be the largest in the kingdom. The demand for additional market accommodation seems to be growing throughout the country. Besides several markets in progress, we observe that Rotherham, Mexborough, and other towns, have applied to the Local Government Board for their sanction to borrow money for constructing new markets, or enlarging those already existing.

The magnificent Sanatorium erecting, from the designs of Mr. W. H. Crossland, at the cost of Mr. Holloway, near the Virginia Water Station of the Staines and Reading branch of the South-Western Railway, is, as far as the exterior is concerned, approaching completion; but much remains to be done to the interior, and some months must elapse before it can be ready for occupation. As the reader knows, it is intended for persons of the middle class suffering from mental disease, and it is proposed to be fitted with the most approved medical and sanitary appliances, and with whatever may conduce to the cure, or ameliorate the condition, of the patients. The building is of great extent; the principal front is above 500 feet long, the greatest depth over 200 feet; it stands on an elevated site, and, with its lofty central tower, forms a conspicuous object for a considerable distance. It is constructed of deep red brick, with dressings, very freely used, of Portland stone. The general style and appearance will be best understood from the engraving, though the smallness of the scale does not allow the enrichment to be distinctly shown. The interior contains, besides the ordinary patients' rooms, a large dining-hall, drawing-rooms, libraries, billiard-rooms, and others of a kind that would hardly have been dreamt of in connection with an establishment of this class a generation or two ago. The rooms, with the handsome bay-windows running along the entire front and sides of the building—there are 14 in all—are the patients' "day-rooms," and will be light and cheerful apartments, each 30 feet by 20 feet, without the bays, and some of them have bays of equal size at each end. The eastern half of the building is for female, the western for male patients. The costly Ladies' College, which the same architect is erecting for Mr. Holloway, a short distance eastward (towards Egham), is also being pushed rapidly forward. Among completed hospitals it may be enough to mention the very unpretending, but very pleasing, and admirably-planned building, erected by Mr. E. Turner, for the Central Throat and Ear Hospital in the Gray's Inn Road. The new wing added to the London Hospital brings the number of beds provided by that institution up to 800.



Sanatorium, Virginia Water.

5.—Buildings connected with Education, Art, &c.

At Oxford, the work of restoring, rebuilding, and adding to the several colleges, goes on merrily. Ere long, the old University will, to outward appearance, have become a bran new one. Christ Church is brightening up amazingly. The famous Tom Quad. has been entirely renovated; the floor lowered, the stonework renewed throughout; the old battlements cleared away, and a parapet with shields and carvings substituted. When the new tower, which Mr. Fergusson has designed for the Cathedral, is completed (but of the commencement of which there is at present no sign), Christ Church will look quite young again. New College is already rejuvenescent. Sir Gilbert Scott has nearly completed the New Buildings. They form a long range between Holywell and the City Wall, and provide several sets of rooms for the fellows and undergraduates, lecture rooms, &c. The Holywell Street front presents a solid pile of four storeys, faced with stone, with bays, gables, and dormers, and a good entrance gatehouse, and groined passage. The inner front is similar, but is improved by a picturesque angle stair turret. About both is some very careful carving. The works at All Souls Chapel have been completed by the restoration of the lofty reredos, a remarkable and imposing fabric, towering tier above tier of saints under tall fretted canopies, and terminating in a Majesty. The centre-piece, directly over the altar, is a representation of the Crucifixion carved in high relief by Mr. Geflowski. The elaborate restoration of St. Mary's Church has also been completed under the direction of Sir Gilbert Scott, R.A., at a cost of nearly 20,000*l*. The New Buildings at Balliol are finished, the new Hall nearly so. This Hall is a noble room, worthy to rank with the best of the old Halls of Oxford. It is 96 feet by 36 feet, is faced with Bath stone, the lower part of course wainscotted with dark oak, has "storied windows richly dight," and a massive open-timber roof, the old hall being converted into a handsome library and reading room for the undergraduates. Mr. Waterhouse was the architect. At Merton, Brasenose, Wadham, and other of the older colleges, the work of restoration is going on continuously. At Keble, the youngest born, the great work of the year is the completion of the Chapel. Externally as peculiar, we do not like to say as ugly, as the rest of the College, the interior is as gorgeous as marble, colour, mosaics, and painted glass can make it. Half the saints of the calendar are there—and some that testify strongly to the Catholicity of the English Church—arrayed in brightest mediæval drapery, with more than mediæval disregard of drawing and veracity. The chapel is 124 feet long, 35 feet wide, and 90 feet high, and its loftiness and splendour produce a very striking effect, despite its narrowness, and the glare and crudity of colour in the mosaics. A hall and library are being built next the chapel. The hall, it is said, is to be of the same width

as the chapel, but 12 or 13 feet longer—a strangely attenuated proportion, it seems to us; the library 86 feet by 35 feet, which is more promising. The entire cost of the chapel, some 50,000*l*., was provided for by the late Mr. W. Gibbs, whose relatives are erecting the hall and library. The architect, as of the rest of the college, is Mr. Butterfield; the mosaics and painted glass are by Mr. A. Gibbs. The Divinity Schools and Bodleian are both undergoing repair and renovation. The new Schools have not been commenced.

At Cambridge, the most prominent work is the virtual rebuilding of Pembroke College, under the superintendence of Mr. A. Waterhouse. The old hall is gone, the fronts towards Pembroke street and Trumpington street will be entirely new. If Queen Victoria were to visit Cambridge, she would hardly exclaim, as did her great predecessor Elizabeth, on seeing Pembroke, "Oh! domus antiqua!" King's College has been partially smartened; and Queen's has had its extended frontage entirely renewed. The dilapidated old houses that hemmed in Magdalene have been swept away, and the space in front laid out, so as to effect a great improvement in the appearance of the college and locality. Christ's College has built a new hall; Downing a new block of buildings on the north-west of the quadrangle. Trinity has built new lodgings, and made its chapel more conformable to ecclesiological notions. At St. Catherine's a new master's lodge of red brick and stone has been built from the designs of Mr. W. M. Fawcett. At Jesus, the hall has been lengthened, and various improvements effected in the college buildings. The new Cavendish College is making progress; new Divinity Schools are about to be begun, and a commencement has been made, under Mr. Fawcett, with the erection of the new Museum.

The works at Harrow are being steadily continued; at Eton, the clock tower has been restored, and there have been considerable extensions and restorations in other parts of the fabric; and many alterations and improvements have been carried out at other of our large grammar schools. A new grammar school has been built at Wallasey, from the designs of Mr. T. Reade. It is of the local sandstone, Gothic in style, and has accommodation for 200 boys, but is planned to provide eventually for 400. The Congregationalist body have rebuilt Airedale Theological College on a larger and more liberal scale than the old college. The architects are Messrs. Lockwood and Mawson. In the New Kent Road, London, a college for theological students and lay preachers of the Church of England, called the Priory of St. Austen, has been completed from the designs of Mr. Norton. Only the chapel, of a strongly accentuated Second Pointed type, is, however, entirely new; the college being formed by uniting and remodelling three private houses.

School Board schools continue to be erected throughout the country, and all of them with some outward architectural character, and with internal arrangements and fittings much beyond previous schools of the class. The London School Board has certainly accomplished great things. Sir Charles Reed, the

chairman, in his *resumé* of the work of the Board during the six years it has existed (October, 1876), stated that 134 schools had been built and opened, accommodating 115,942 children; and that 40 more, with accommodation for 31,199 children, were building or contracted for, of which 12 will be opened in November, a result of six years' labour in school building probably unparalleled. If school extension were in question, the figures must be largely increased, the total number of schools provided by the Board being 221, with 182,211 children. Birmingham, and several other of the larger towns, have made commensurate efforts, whilst Sheffield has set an excellent example in building a spacious central school—a Gothic building of a superior grade—at a cost of 42,000*l.*, to be used "for the purpose of giving clever boys and girls, draughted from the ordinary Board schools, a higher education."

Sheffield has also, through its corporation, erected free libraries at Highfield and Upperthorpe; neat Italian buildings of brick and stone, with some good carving by the doorways. Mr. D. Chadwick, M.P., has erected a library at Macclesfield, placed in it 10,000 volumes of books, and presented it to the town on condition of the townsmen adopting the Free Libraries Act. At High Wycombe a Free Library and Institute has been erected from the designs of Mr. Raffety. A Public Art Museum has been erected at Leicester, from the designs of Messrs. Shenston and Baker.

The Isaac Watts Memorial, Southampton, has been opened. The building, designed by Mr. H. J. Paull, of Birmingham, is "Free Italian" in style, the chief feature of the exterior being a low massive tower. The hall, 52 feet square, will accommodate an audience of 1,000 persons. There are besides a library, class rooms, &c. The building covers a part of the garden of the house of Isaac Watts' father. The Scarth Memorial Hall, erected at Staindrop, near Darlington, as a memorial of the late head agent of the Duke of Cleveland, provides a public hall for meetings and concerts, a library and reading room, club room, &c. Other working men's halls, masonic halls, music and concert halls, a hippodrome, and the like, have been erected, but none call for particular notice.

The works at the National Opera House have been suspended, so that all probability of the building being ready for opening next spring is at an end. The delay, if only temporary, is hardly to be regretted. Buildings of such a kind cannot be raised at headlong speed without detriment; and there is much in the design of this building that may be reconsidered with advantage.

The Westminster Aquarium was described last year; here, therefore, it will be enough to record its formal opening. Aquariums have also been opened at Plymouth, Yarmouth, and probably elsewhere, but the passion for them seems to be abating. Rinks are in like case; new rinks continue to be opened, but many of the earlier are closed, and that at the Westminster Aquarium is about to be abolished. They have added nothing to the architecture of the country.

6. Street Architecture.

It is in the street architecture of London and the larger provincial towns that the great body of architects, and especially the younger ones, will for some years to come find their richest harvest. The desire for new offices, warehouses, and shops, is continually spreading. For awhile most of the new commercial buildings were erected because they were required; now the new buildings are so numerous, and are found to be so attractive as a business advertisement, that firms which do not wish to be regarded as falling behind in the race of competition build in self-defence; and as they can no longer afford to occupy the dull old buildings, they go to the utmost limit in costliness, out of rivalry or calculation. The consequence is that everywhere there are new commercial buildings, and that everywhere they are architectural. In some, perhaps in the majority, the taste may not be very pure, but all, if not beautiful, are rich, or are made to look so.

In strict architecture the mixture of styles which it is the fashion to call Queen Anne's, appears to grow in popularity. As it allows of rooms of any height and shape, with windows of any form or size, it is not surprising that business men find that it provides them with offices and show rooms that are light, convenient, and agreeable. But seeing how entirely the life, habits, and trade of our busy towns are the creation of our own day, and how thoroughly different they are from those of the dull, plodding, sober citizens of the past ages, it is wonderful that, in providing for their wants, the architect should hold himself bound to imitation and precedent. Books, buildings, and museums are ransacked for old "novelties." Why will not some architect venture on a little originality?

The most noticeable of the City buildings completed are some of the offices and shops in Queen Victoria Street, and the Holborn Viaduct Railway Station and Hotel. Queen Victoria Street, from the impregnable National Safe Deposit by the Mansion House to the Victoria Embankment, is fast becoming a double line of and tall and costly structures. Mostly stone-faced, with an abundance of bold carving, the street as a whole is assuming a very imposing air of stateliness and wealth. Apart, the buildings are many of them in very questionable taste, the ornaments tawdry, overcrowded, misplaced, and obtrusive, but the *ensemble* is not ineffective, and the costliness is unquestionable. The Holborn Viaduct Station and Hotel is of great extent, having a frontage towards the Viaduct of 235 feet, with a depth of 70 feet. The basement is a loggia, above are five floors variously apportioned, and terminating in a lofty crested roof, with pyramidal pavilion roofs to the wings. The façade is faced with Portland stone, the style Italian, the tall shafts of the principal order being carried up through three storeys. The repetition of similar forms through so great a length, and the absence of projecting features, produce something of flatness and monotony, but the building is a rich and stately one, and forms

a striking opening feature in approaching the Viaduct from the east. The architect was Mr. L. H. Isaacs; the cost 120,000*l*. Several other spacious and substantial edifices have been built along the Viaduct, but there is, especially in the houses of the Viaduct Company, too frequent a reference to the pattern book.

Queen Anne's Chambers, Poultry and Bucklersbury, may be cited as a strongly pronounced example of the fashionable style. It was designed by Messrs. Belcher, is of red brick and stone, has bold bay windows, quaint dormers, and tall green slate roofs. A more modest and more satisfactory example of the revived style is a house and shop in High Holborn (No. 304), designed by Mr. C. J. Shoppee. But the materials would have been novelties to an architect of Queen Anne's day. The front is of Ancaster and red Mansfield stone, the pilasters of polished red granite, the frieze of Lizard serpentine. A striking and characteristic Queen Anne house in course of erection on the east side of Aldersgate Street, appears likely to be one of the most effective examples of the style.

Ludgate Hill and Holborn Circuses are pretty well completed, and many large blocks of offices, shops, &c., have been built or are building in their vicinity. The vacant spaces about the Viaduct and along the Farringdon Road are being gradually occupied. Many of the buildings are large and substantial structures, nearly all are lofty, and the newer ones show a desire to meet the demand for greater window space. But in none of them, nor in the offices and warehouses in the streets of which Wood Street may be regarded as the centre; in those farther east, nor in the new shops in the Poultry, Cornhill, Leadenhall Street, &c. do we observe any very marked originality or decided innovation. Still the newer houses are better than those of a few years back; the materials are more carefully selected, and there is on the whole less extravagant decoration and misapplication of costly materials.

A few buildings may be noticed as illustrative of their classes. On the site of the church of St. Mary Outwich, at the angle formed by the meeting of Threadneedle Street with Bishopsgate Street, a large and lofty pile of offices has been erected from the designs of Mr. T. K. Green. The buildings are faced with stone, the style Renaissance, of a semi-classical type, perhaps selected on account of its proximity to the National Provincial Bank, but though a stately structure, it contrasts unfavourably with that building. Messrs. Lacy's Bank, West Smithfield, designed by Mr. R. Walker, is noteworthy for its quiet substantial dignity rather than for magnitude or ornament. The building is of brick on a basement of Portland stone, with bold piers on bases of polished granite, piers, well-carved capitals, mouldings, window dressings, and cornice, being all of Portland stone. The banking room is large, lofty, well proportioned, and well fitted.

The Finsbury Printing and Stationery Works of Messrs. Waterlow and Sons, is one of the largest and most remarkable

establishments in London. It occupies the site of the late Finsbury Market, the principal front being in Clifton Street. It is 166 feet by 152 feet; comprises a basement and five upper storeys; and is built throughout of perforated bricks with concrete window heads and dressings. Except in the capitals of the piers, cornice, and attic, there is little ornament, but the great size of the structure, the evident adaptation of the whole and every part to its purpose, and the careful workmanship throughout, impart a dignity and propriety of character looked for in vain in many far more highly ornamented and pretentious piles. The interior is equally or more noteworthy, as much for the careful sanitary arrangements and precautions against fire, as for the various working appliances. The rooms are made as far as possible fireproof, and all direct interior communication is cut off between the several sections. The area of the various floors amounts to 130,000 square feet, and provides working room for 2,000 hands. The architect was Mr. W. W. Lee.

In the neighbourhood of the new Courts of Justice blocks of offices are springing up on all hands. The most important yet planned is Court Chambers, Serle Street and Carey Street, which promises when completed to form an imposing pile. It will form a block of 13 houses about a central court or quadrangle, which is to be laid out in an ornamental manner, and have a central fountain. The architect is Mr. A. Waterhouse.

The well known Hanover Square Rooms, the pleasantest concert room in London, and that in which chamber music was heard to most advantage, has been converted, under the direction of Mr. R. E. Tyler, into the Hanover Square Club. The exterior has been made sufficiently club-like, and the interior, in addition to the usual stately rooms and luxurious fittings of a West-end club, has chambers for the accommodation of foreign and country members. Grafton House, Clarges Street, Piccadilly, the former residence of the Duke of Grafton, has been transformed into the Turf Club, under the direction of Mr. J. Norton. The Central City Club, Walbrook, is making progress, but is as yet only in its early stage of growth.

New Clubhouses have been built or are in progress in several country towns. The Brighton New Club, King's Road, is a large and luxuriously fitted edifice, designed by Mr. T. Lainson. The Trevelyan Club, Bury, adjoins the Philips' Hall, Garden Street, both buildings being designed by Messrs. Maxwell and Tuke. The Yorkshire Residential Club, Ilkley, and others, are more or less advanced.

Banks have been completed at Norwich, for Messrs. Lacon, an Italian building, designed by Mr. W. O. Chambers; at Middlesborough, for Messrs. Backhouse, designed by Mr. G. G. Hoskins; at Watton, for Messrs. Gurney, from the designs of Mr. Boardman, of Norwich; at Carlisle, for the Carlisle and Cumberland Banking Company, a Venetian Gothic building, designed by Mr. C. Hetherington; at Derby, for Messrs. Smith, a semi-classic structure of the Corinthian order, designed by Mr. Isborn;

at Worcester, for the Stourbridge and Kidderminster Banking Company, a French Renaissance building, designed by Mr. H. L. Florence; at Fordingbridge, for the Wells and Dorset Banking Company, designed by Messrs. Welch and Reynolds; and at Birmingham, for the Birmingham Joint Stock Banking Company, a large and handsome early Italian Renaissance edifice, of Portland stone, with polished Aberdeen granite columns, and some good carvings, designed by Mr. F. B. Osborn.

We have notes of offices, shops, warehouses, and hotels in Manchester, Bradford, Leeds, Halifax, Northampton, Newcastle, Buxton, Brighton, Tunbridge, Canterbury, Burton-upon-Trent, and many other places, but must leave them with this general reference.

7.—Docks, Bridges, &c.

The first section of the great scheme of Extension Works at Portsmouth Dockyard was formally opened by Princess Louise (Marchioness of Lorne) in April last. The completed portion comprises tidal and repairing basin, a deep graving dock, locks, and connecting ways, and occupies an area of 178 acres, more than doubling the extent of Portsmouth Dockyard. The estimated cost of the extension was 2,350,000*l.*, the expenditure to the present time has been about 2,000,000*l.* The deep graving dock 458 feet long and 100 feet wide, with locks of the same width, and a depth at low water of 30 feet over the inverts, is said to be the finest graving dock yet constructed. The repairing basin is no less than 1,369 feet long and 700 feet wide, with a depth of 30 feet, and encloses an area of 22 acres. The completed building docks are each 448 feet long and 110 feet wide, with a depth of above 32 feet over the inverts, the walls being built of Portland stone, except in one instance (No. 13), where, from the character of the surrounding soil, it was deemed advisable to use granite. Other works are the rigging basin, which has an area of 14 acres, and an entrance 94 feet wide, and the tidal basin, not yet completed, the entrance to which is 300 feet wide, and which will, in effect, form part of the harbour. The works at Chatham Dockyard are being steadily prosecuted, but no important section has this year been completed.

A new dock has been opened at Berwick-on-Tweed, and will, when the communication is completed with the North-Eastern Railway, be of great advantage to the port. On the left bank of the Thames important works are in progress for the extension of the Victoria and St. Katherine Company's docks. The extension will give a new entrance to the Victoria Dock at Galleon's Reach, about 3½ miles lower down the river than the present entrance at Blackwall, and will add 95 acres to the existing area, about doubling the dock area, besides adding an immense extent of wharfage. On the right bank of the Thames important extension works are in course of completion at the Commercial Docks.

At Liverpool, the new landing stages, which have been some years in course of construction, have been completed. The structure is some 2,062 feet long and from 80 to 100 feet wide; is floated on enormous iron pontoons, and united with the masonry of the pier walls by iron booms, and by seven passenger bridges, and a great floating bridge 300 feet long and 40 feet wide, for goods traffic. Considerable dock extensions are also in progress; it is estimated that these extensions and the landing stages will cost about four millions. Two new docks, with about 18 acres of water and over 7,000 feet of quays, are in course of construction at Hull. The Town Council of Wisbeach have decided to consult engineers as to the best means of carrying out the scheme for new docks; and steps are in progress for improving Warkworth harbour.

No very important bridge has been completed, with the exception of railway bridges, which do not come within our notice. The Severn Bridge, which excites so much interest, is making satisfactory progress, but is yet far from completion. A bridge of some interest to engineers, on account of the economy of its construction, has been erected over the Wye at Hoarwithy, 9 miles from Hereford. It is a lattice girder bridge of three spans, with diagonal bracing and trussing. The girders are 255 feet long and 5 feet 6 inches deep; the roadway, formed of Westwood's corrugated flooring plates, is 15 feet wide. The constructive peculiarities, which are the chief interest of the work, are purely technical. What may be of more general interest is the fact that the entire cost of the bridge was considerably under 2,000*l*. The engineer was Mr. W. C. Whitaker, C.E.

The Thames Conservancy Commissioners have erected a new pier and landing stage at Chelsea, in place of the old Cadogan Pier, and somewhat to the east of it. The new Cadogan Pier is, perhaps, the best looking steamboat pier on that part of the Thames. Its stability is ensured by timber and iron framework carried on iron cylinders 8 feet in diameter, which are sunk at each end of the stage and filled with concrete. The landing stage is about 150 feet long and 50 feet wide, and is connected with the embankment by an iron lattice bridge 200 feet long, with a roadway of 15 feet. The shore half of the bridge is on a level with the embankment, and is supported on a framework of iron columns; the river half is movable, rising and falling with the tide. Close to the pier the embankment wall has suddenly bulged outwards for nearly 100 yards, attended by a sinking of the road and gardens. Believing it to be due to the drag of the massive girders of the pier, these have been disconnected from the embankment. The injury, however, it is now seen, was not caused by the pier, but probably by a land spring. The damage is being repaired, and measures will be taken to prevent its recurrence. It is a warning how much care and watchfulness are required in the construction and maintenance of works of this kind.

JAMES THORNE.

THE EXHIBITIONS OF PICTURES IN 1876.

As the years roll on exhibitions of pictures increase in number, and it may be presumed in attractiveness. Instead of being content with the half-dozen exhibitions of the season, and perhaps one or two in the winter, we have galleries open now all the year round, of all classes, and in all sorts of places. Besides the summer and winter exhibitions of the Royal Academy, the Society of British Artists, and the two Water Colour Societies, there are the summer and winter, cabinet, and black and white displays at the Dudley Gallery, the apparently permanent Doré Collection, French and Belgian and so-called International Exhibitions, an endless number of exhibitions of single pictures, of the pictures of individual artists, the shows at the Crystal and Alexandra Palaces and the Westminster Aquarium, and others in rooms and galleries of all kinds. A large proportion of these are trading displays. The dealer is now the recognized art-patron, and dealers have come to appreciate at their full value for trade purposes exhibitions of collections of paintings as well as of single pictures.

With these last we have no concern, but even the more legitimate exhibitions are too numerous to notice in a broad and rapid survey. It will be sufficient, as it seems to us, to take the Academy as the representative exhibition, and to glance in succession at such of the pictures as serve to mark the position of our painters and the direction in which they seem to be moving.

Broadly, the exhibition of the Royal Academy of 1876 must be pronounced weak in religious, strong in classic, or rather neo-classic art. Many years have passed since two such large and important works were exhibited together as Leighton's "Daphnephoria" and Poynter's "Atalanta," the one 17 feet by 7 feet and a-half, the other 14 feet by nearly 5 feet. The "Daphnephoria" represents "a triumphal procession held every ninth year at Thebes, in honour of Apollo, and to commemorate a victory of the Thebans over the Æolians of Arne. Its name was derived from the laurel branches carried by those who took part in the festival, the laurel, or more properly the bay, being sacred to Apollo." The procession stretches across the canvas; the background is a sombre grove of pines and cedars, with an undergrowth of bays. Leading the procession is the Daphnephoros, or laurel bearer, a youth chosen, as Pausanius tells us, for his strength and beauty, from amongst the noblest families of Thebes. He was elected priest of Apollo for that year, was clad in a sumptuous robe which reached down to his feet, on his head was placed a golden crown. Before him walked a youth, his nearest kinsman, bearing a piece of olive wood, on the top of which was a brazen globe, and suspended from it were garlands of laurel and various symbolic ornaments. Next the priest went boys carrying trophies of golden armour; and behind them followed a choir of maidens crowned with laurel and having laurel branches in their hands,

singing hymns as they walked in praise of Apollo. The Theban boys carrying the brazen tripods dedicated to the god, closed the procession. A splendid subject, admitting of any degree of grand or brilliant treatment, we can easily imagine how differently but with what festive richness and pomp, and buoyant life and gaiety, Mantegna, Veronese, or Rubens would have treated it, how thoroughly Ethnic in spirit though it may be inaccurate in costume and character. How an ancient Greek would have represented it we can only guess from such works as the Panathenaic procession in a sister art. We have not, however, to do with a Hellenic or Renaissance artist, and it is hardly fair to subject our academician to the imaginary comparison. He has done his work carefully, conscientiously, and, from his own point of view, well. The accessories show diligent research. The archæology is not obtrusive, but you feel that you are before the work of a scholar, and yield without hesitancy even when your own memory might lead you to question some peculiarity of costume or symbol. The drawing is admirable, especially the leader of the chorus, whose back is towards the spectator. But all the undraped male figures are drawn and modelled with great skill. The maidens are less happy. They are wanting in the primary Greek attribute of grace, their robes, taken as would seem from antique vases, are inelegant, and all charm is destroyed by the position of the heads and the widely-opened mouths. At the best a woman's features, when mouth and throat are strained in loud singing, are only rendered tolerable by the sounds which charm the ear and lead away the thoughts from the distortion of the countenance. A photograph of Titiens or Nilsson in the act of singing would be simply frightful. And if this be true of one, what must a whole bevy of maidens be, with their heads thrown back and mouths agape? Mr. Leighton has softened down the distortion as far as he could, but it is there still. The question of a very young critic who passed before the picture as we were one day contemplating it, conveys in two words all that an old critic could hope to say in a hundred: "Mamma, what are all these people *making faces* for?" Perhaps in its place in Mr. Hodgson's saloon the silent singers may not strike so unpleasantly on the eye. A picture of this order to be judged rightly should be seen in the place it was painted for.

Mr. Poynter's "Atalanta's Race" (943), is only inferior in size to Mr. Leighton's great work. It is equally careful, learned, and refined in conception, execution, and research, and, like it, admirable for what is commonly said to be the weak point of English artists, drawing, though curiously enough in both the principal figure is of exaggerated proportions. In Atalanta, however, the enlargement is beyond all probability. She is stooping, but it is plain that if she stood upright Meilanion would look but a shrimp beside her. Meilanion is capitally drawn and poised. The muscles are well marked and not over done. But it is not the Meilanion of the Arcadian struggle. He ran for the god-nursed bride or death at her hands. This Meilanion is as cool and self-

conscious as a runner at Myers' Hippodrome. You would see far more earnest running at Princes' ground or Lillie Bridge, whenever the amateur element was engaged. Atalanta is designed with wonderful skill. The position is peculiar, very difficult to draw, but the drawing is faultless, and you see at once, even without the secondary but significant movement of the drapery, that the action has been suddenly arrested. But there all interest in the race ends. Without any knowledge of Atalanta's antecedents, it is evident that her's is a willing defeat. From such a stripling a woman of her form could run away without straining a muscle. The lookers-on show more interest, but you cannot share and can hardly understand their excitement. The scene, in short, wants reality. It is excellently painted; the colour, allowing for the dominant tone, which scarcely admitted of richness, depth, or splendour, is clear, refined, and harmonious; and there is a prevalent air of elegance and distinction that is very attractive. But, like Mr. Leighton's work, it fails to rouse the sympathy of the spectator. You miss the motive for so large and elaborate a production; and you leave it with much the same sort of listless admiration that you would turn from a first-class piece of decorative furniture. And this in truth is pretty much what both these pictures are. Leighton's, as we have said, will adorn an apartment in a private house, and Poynter's is to find a home in Lord Wharncliffe's country seat. Hence perhaps the lightness of tone, what in the exhibition room seemed the excessive smoothness of finish, and the general absence of vigour and earnestness in both the pictures. But admitting that for the positions they are to occupy, there may be a certain propriety in the style adopted, we cannot but feel that for pictures of this class and size a nobler and more elevated style is conceivable and desirable; and that if Greek life and character, whether in history or fable, be exhibited, an effort should be made to reproduce the ancient Greek thought and feeling.

Marked as is the influence of the French school in both these pictures, it is still more evident in the "Phryne" (No. 909) of Mr. Armitage. It at once recalls the "Source" of M. Ingres, in friendly rivalry with which we may suppose it to have been painted. Like the Source, Phryne faces the spectator wholly unclad, as she is quitting the sea in which she has been bathing. But with the fact of their being two life-sized undraped female figures the similitude ends. The Source has been felt by all to be the embodiment of purity, and if somewhat modern for a goddess of the stream, the nearest modern realization of the ancient idea. Phryne is equally decorous; but Phryne was no abstract divinity, but a mortal far from cold or chaste. Apelles, as the catalogue is careful to tell us, saw her thus on the seashore and was incited thereby to paint his Venus Anadyomene. The Phryne of this canvas assuredly raises no thoughts of Aphrodite. It is merely a commonplace painter's model, and judging from the countenance and tenuity of limb, a French one. The figure seems to have been a study painted from the life, and the title an

afterthought, when waves and sand and sea-weed were painted in to complete the picture. But even as a study, it is unworthy of Mr. Armitage's pencil. The flesh is solid, bloodless, without warmth or variety, and of a most uninviting hue; the drawing, at least of the upraised and foreshortened arm, more than questionable.

In strong contrast with this is another naked female, lying stretched at length, "After the Dance" (927), by Alma-Tadema. Here there is life—warm, flushed, and palpitating. She has been described as a Bacchante, and the tambourine she is holding is intended probably to suggest that title. She is not, however, a Bacchante of ancient Greece, nor has she the lusty, youthful beauty of Titian's fine old Pagan out-door Bacchantes; rather she seems to be the trained and pampered hireling of a Roman voluptuary, glowing in the lassitude following intense exertion and high-wrought excitement. It is not a work one can esteem, but the artistic power displayed in it is worthy of all admiration. It belongs to a low order of Art, but of its kind it is nearly perfect. No work of a like class in the Exhibition could for a moment bear comparison with it in the modelling, and the exquisite colour and graduation of tints in the flesh, the mastery of handling, and the easy tact and skill with which the accessories are made to support and subserve the main figure.

Mr. Alma-Tadema's second picture, "An Audience at Agrippa's" (249), is of higher aim and interest. It is of moderate size, but full of life, character, and meaning. Agrippa is descending the marble staircase of his palace, followed by his courtiers, clients, and suitors. Behind a table at the stairfoot are clerks bowing low before him. On one side is the colossal statue of the Emperor; in the foreground are a priest, and male and female suitors, waiting to do homage, or offer their petitions. It is nothing but an everyday incident, but it is an incident of old Rome, and you seem transported into the very presence. It is, perhaps, too decidedly French in character; but it is life-like, true, and vivid, and French art assimilates better with Roman than with Greek topics. You may not care much for the people, but they are the very people the painter meant you to see; they are occupied as you would expect to find them; and the adjuncts are represented with rare force and fidelity. The surface of these is imitated with almost deceptive reality, and yet each holds its exact place, as in the actual scene. It is only when your attention is directed to the marble walls or tiger skin mat, that you notice how perfectly they are painted. The spectator may not always like the subjects Mr. Alma-Tadema chooses, but it is always a delight to meet with such perfect workmanship.

There are other classical or semi-classical pictures, such as the "Beads" of Albert Moore, and Briton Rivière's "Pallas Athene," but they are not among the painters' happier productions, and other works are unimportant.

In the religious and historical pictures, generally taken as the tests by which to estimate the standing of a school, the exhi-

bition was by no means rich. Probably Mr. E. Long's "Pool of Bethesda" (891), attracted most attention. A mother with her sick child, a blind and aged pilgrim, the impotent, halt, and withered, have come, or been brought by their friends and laid at the edge of the pool, and are anxiously waiting for the moment when the angel shall descend and trouble the water. The pool, the building which covers it, the crutches and other votive offerings hung upon its massive columns, the people and their costumes, have been studied from the realities in the East. The sufferers are eagerly looking for the miracle that is about to be performed. The purpose is worthy of all respect; whether the success is equal to it we will not undertake to say. The picture is advertised as about to be engraved, and if fairly executed, the print will, no doubt, be popular.

Mr. F. Goodall's "Holy Mother" (182) will also, in due season, share the same distinction, and may make another popular religious print. It is carefully painted, but will scarcely satisfy any one's ideal. The Holy Mother is habited in a modern Oriental garb, the child in her lap is naked. But while the costume is Oriental, the faces are of a Western type, and the union of realism with conventionality does not exactly harmonize. It is an elegant picture, but we gaze on it unmoved. Mr. Armitage's "Hymn of the Last Supper" (579), startles at first by the unwonted glare of white; but, becoming accustomed to it, we see that the painter has really worked out a highly refined scheme of colour from that unusually high key. Yet while we admire, we are hardly pleased. Mr. Armitage has fallen in with the current phase of art thought. He has made the scene and its surroundings strictly and literally true to Eastern life. The Saviour and the Apostles are studied from Oriental Jews, and their habits are the habits found in Jerusalem. Whether in any case this literalism would have been satisfactory may be doubted, but Mr. Armitage has not given himself and his theory a fair chance. His models are not only modern but vulgar. The countenance of the Saviour is commonplace; those of the Apostles singularly unintellectual, and, curiously enough, all have thick crops of unkempt hair. And as if this were not enough, they are all open-mouthed, and yet not singing; plainly only models, putting their faces into what they suppose would be their condition if they were singing.

Our older historical and poetic painters did not put forth their strength. Herbert's "Lear disinheriting Cordelia" (189) was merely a replica in oil, on a reduced scale, of his fresco at Westminster. Mr. Poole's "Meeting of Oberon and Titania" (175), was certainly the weirdest rendering of a fairy scene ever put on canvas. At a little distance you might mistake it for a moonlight war-dance of Red Indians; but as you approached, and the figures became more distinct, you were satisfied it could be no encounter of earthly beings. Perhaps Mr. Poole's vision of fairyland is the true one, but we can hardly fancy it to be Shakspere's.

The mention of a veteran painter at once recalls the memory of John Frederick Lewis. Here were three of his remarkable pictures, "The Mid-day Meal, Cairo" (187), "A Cairo Bazaar" (222), "On the Banks of the Nile" (1262)—painted in his 70th year, before he laid down his pencil for ever—as full of character and incident, as bright and gem-like in colour, minute in execution, and almost as broad and vigorous in effect as ever, only lacking just something of the vivacity and freshness which can only be acquired or maintained by actual contact with the reality. You were, however, only surprised that so much of the freshness was retained, not that something of it was lost, when you recollected that more than a quarter of a century had passed since the painter left the East. How well we remember his return home after his ten years' stay there, bringing with him an almost endless variety of studies and sketches, and an entirely new style! His change of style and adoption of oil in place of the water (or body) colour, in which he had achieved his early fame, were regarded as more than hazardous in an artist of his standing; but the public approved, his popularity rapidly increased, and he soon took a place apart, which up to the last he maintained. And no amount of popularity, no eagerness to obtain pictures from him, ever induced him to let one pass from his easel till he felt that it was as good as he could make it. If his genius has done honour to English art, his career as a painter has no less been a bright example to the rising generation of English artists.

A man cannot paint such a picture as "The Three Jolly Postboys" every year; but Mr. Marks' "Apothecary" (156) is a work of great ability, and will maintain his reputation. His

"Journeys end in lovers' meeting
Every wise man's son doth know,"

is a pretty little pastoral, touched in with the quiet grace and humour of Addison or Washington Irving. Without filling Mr. Marks' place, Mr. Yeames shows some enjoyable dry humour in his "Last Bit of Scandal" (233); it is a vein he will do well to work further.

Those who saw Mr. Fildes's "Applicants for Admission to a Casual Ward" in the Exhibition of 1874 would look with eagerness, not unmixed with anxiety, for any new work of his. "The Widower" (476) was sufficient proof that there was no loss of power or pathos. A more touching group than the rude broken-hearted father bending over his dying child, and the sickly tearful girl looking on, ready to help if help is needed, but half concealing herself and struggling to hide her sorrow, was never, perhaps, painted. And all else was in keeping. But the size of the canvas was out of all proportion to the subject, unless indeed we possessed a Luxembourg in which such a work might hope to find reception, or it could reckon on a place in the National Gallery. A work so painful in subject, and on such a scale, would be unendurable in any private dwelling. Mr. Fildes possesses such unusual capacity that it is quite grievous to see

him squander it as he has done in his latest pictures. But whatever be the fate of the picture, we can only feel respect for the painter. He may have made a mistake in size, and to some extent in subject, but we cannot fail to recognize in his work depth of feeling and sincerity of purpose. After regarding a picture like this, we recoil with the keener disgust from such a specimen of simpering imbecility as "The New Curate" (101), though no doubt it found some sympathetic and suitable purchaser. Of like feeble and foolish rubbish there was, unhappily, a superabundance in the exhibition, and we may pass on to something better.

A word of praise is due to Mr. Gow's "Relief of Leyden" (381), and Mr. Wallis's "Outside a Prison in Southern Italy" (322), two works which have only in common the merits of originality, perception of character, and thoroughly artistic handling. Worthy of a place beside them, though very different in style, is Mr. Orchardson's capital "Old Soldier" (892); his "Bill of Sale" is perhaps equally clever, but less agreeable.

There were a few good portraits of men. The women, though one shrinks from saying so, were wanting in *charm*. This must, of course, be set down to the failure of the painters. Our maidens and matrons are not less lovely, we are sure, than were their grandmothers, nor their dresses much more preposterous or ungraceful. And yet how lovely the past generation appears on the canvases of Gainsborough and Reynolds, how far otherwise the present generation on the canvases of our R.A.'s.

The largest and most prominent landscape was Mr. Millais' "Over the Hills and far away" (106). As a nearly "life-size" out-of-door study of a bit of upland bog, of swamp and sedge and rush and tall tangled grass, it is pleasant to look upon. In accuracy and patient elaboration it rivals the labour of a botanical draughtsman, with the addition of thoroughly artistic colouring. The heathery slopes beyond are as true as the bog and more pictorial. The distant hills and rainbow are make-weights put in to round off the design. If a landscape be the actual representation of a scene in nature, as a camera might represent it, with the addition of colour, this is a great work. But if that something more be required which the scene owes to the mind of the painter (or poet) to constitute it a work of intellectual art, it will hardly satisfy the demand. It is a work of imitation pure and simple, and it is nothing more or higher.

Mr. Brett has essayed again, on a large scale, the combination of minute imitation with vivid colour in "A certain Trout Stream" (365) and "Sir Thomas's Tower" (532), but the mannerism is more pronounced and the result less pleasing than in the painter's large pictures of the last two or three years.

Mr. V. Cole, on the other hand, seems casting off his mannerisms and aiming at greater breadth and elevation of style. His "Day's Decline" is probably the most careful composition he has exhibited. The calm of evening is delicately rendered, the handling sympathetic, the whole tone, arrange-

ment, and materials accordant with the lines of Milton he has chosen as his motto. Perhaps a little more vigour would have sufficed to dispel the suspicion of monotony that creeps over the spectator. Monotony is likewise a little too prominent in the otherwise very pleasant landscapes of Mr. H. W. B. Davis, "Early Summer" (168), "A Spring Morning" (506), and "Rustling Leaves" (550), where the sun is dappling the dewy grass most temptingly. Mr. Davis showed range and versatility in these, but it was a surprise to see from the same hand so different and so masterly a work as his "Mares and Foals," a singularly vigorous, spirited, and skilful representation of a herd of brood mares and foals gambolling at large in a broad sunny plain of Picardy.

Bright, clear, and invigorating as ever were Hook's sea-coast scenes. All were good, but one, "Hard Lines" (498), was a very gem. The simplest of all possible materials formed one of the most perfect possible of landscapes of its class and kind. The little clump of cliff huts, the gap path, the downy slopes, and stretch of land-locked bay, you have seen them a hundred times, though at the moment you cannot name the locality; and that busy bright-eyed girl and fine little sun-burnt urchin, who is longing to be away with the other youngsters dragging up the boat, you cannot doubt are old acquaintances. The truth of effect and simplicity of means observable in these little landscapes lead many to undervalue them. In fact, they are the result of a very remarkable knowledge of the resources of art, and skill in applying them. The art is concealed, but it is there and applied with consummate mastery. His sea piece "Crabbers" (234) will recall the memorable "Luff, Boy!" of seventeen years ago, and higher praise no one can desire. The lifting of the boat by that rolling wave, and the way in which the sturdy boatman steadies it as his mate searches the crab-pot, are perfect.

Mr. Cooke has a charming view of "Philae, the Beautiful" (493), another of the "Ruins of Kom-Ombo" (79), illumined by the western after-glow; and one of the kind with which we have all been long familiar, "A Zuyder Zee Fishing Haven" (223). It really seems as though his late Eastern journey has done something to mellow his genius. There is some very delicate work, signs too of close observation of nature, in Mr. Oakes' "Fording a Tidal Creek" (6), and in F. Morgan's "Haymakers" (2), in P. R. Morris's "Breezy June" (611), in Fahey's Moated Grange, "He never came" (388), Mr. F. Walton's "Abinger Farm" (868), and in Mr. Boughton's very pretty "Surrey Pastoral" (562); but it seems as if the few years of pre-Raphaelite supremacy had sufficed to eradicate the habits and traditions of our old English landscape school. The sharp, crisp touch, clear colour, studied arrangement of lines, and unity and completeness of effect, so strongly insisted on and so zealously aimed after by our early landscape painters, are wholly ignored by our young and rising landscape painters. It may be only a passing phase, but to it we believe is very much due the disesteem into

which English landscape has fallen. Mr. MacWhirter's "Lady of the Woods" (511), and Mr. Hering's "Woodland Waters" (518), display good artistic qualities, and are, in different ways, creditable works. M. Aumonier's views on the Thames are just now very popular, and if one could forget the ever vivid verdure of the Thames' banks, and the depth and beauty of the foliage, we should join heartily in the admiration. They are charming pictures, but they are the products of the studio, not of the out-door worship of nature. The woolly touch, as though everything were seen through a blanket of grey fog, and dusky hues, may be true to French, but is certainly not true to English river scenery, and least of all to our Thames between Marlow and Maidenhead. "Toilers of the Fields" (388) is, however, a delightful picture, and independent of locality.

Two or three more pictures claim a word of recognition, though it be only a word. In his "Saturday Night" (62), Mr. Barnard has, on a large and crowded canvas, sought to depict an East-end market place, and not without a certain amount of success. How far it is true to any particular street we know not, but there is about it an air of exaggerated vraisemblance. Such a scene requires, however, a Hogarth's grasp, clearness, and grim humour to be successful. Mr. Barnard has not reached that standard, but he deserves all praise for a resolute and sincere attempt to represent a remarkable phase of contemporary social existence, almost unknown outside the locality to which it belongs. Like commendation is due to Mr. Macbeth for "A Lincolnshire Gang" (46), a painful, almost repulsive, subject, treated with genuine feeling. Mr. M. Stone's "Appeal for Mercy, 1793" (1326), is a scene in the cabinet of a minister of the first French Revolution, forcibly rendered and nicely painted. Very powerful, too, is Mr. Elmore's rendering of an equally unpleasant theme, "Eugene Aram" (201), on his dreary journey from Lynn between "two stern-faced men," with "gyves upon his wrist," as Hood tells in his famous rhyme. Mr. Cope's portraits of his fellow-Academicians "Selecting Pictures for the Royal Academy Exhibition" (160), attracted much attention on account of the persons represented. It could not fail to recal to the memory Zoffany's famous picture of the Academicians of his day, when Reynolds was president, and Johnson a visitor, we fear not much to the advantage of the present painting or painters.

The Exhibition of the Society of British Artists was no better, perhaps worse, than it has been for years, but as there are signs abroad of amendment, we will say no more of the past, but look with hope to the future. Every one would rejoice in the resuscitation of the Society. An independent exhibition, that should serve at once as a spur and a counterpoise to that of the Academy, would be a real benefit to British Art. But it must be conducted on large and liberal principles, and free from vulgarity, exclusiveness, and cliquism.

The two Societies of Painters in Water-Colours moved on in their old way, and their exhibitions were exactly of the kind we

have grown accustomed to. Delightful places they are to while away a spare half-hour in, but no longer places to call into exercise any serious thought. Both at the Old Society and at the Institute there was a great display of facility, skilful use of the more showy superficial technical qualities, clear bright colour, and dainty handling; only thought, fancy, feeling, and genius, were lacking or latent. In the old gallery were figure pieces of fully average ability and interest by Walter Duncan and Godwin; Boyce had, of course, a notable Farm House, and Davidson, Newton, Moore, and Alfred Hunt, several very clever landscapes. At the Institute there were Hine's and Collier's soft breezy downs; Wolf's animals; Cattermole's and Carrick's English figure pieces, and Gow's French and Flemish soldiers, all excellent of their kind, but none of superlative excellence.

The Seventh Winter Exhibition of Works by the Old Masters and by Deceased Masters of the British School, despite many sinister prophecies, showed no falling off in the number or quality of the works exhibited. The number, 281, was indeed larger than in the preceding year, and the selection not less interesting. The continued excellence of these exhibitions affords a remarkable illustration of the wealth of England in paintings of a high class, and of the liberality of their owners in thus year after year stripping the walls of their galleries or living rooms for months together of some of their most treasured decorations. To this exhibition, for example, the Queen contributed no fewer than 23 of her finest pictures from Windsor Castle and Buckingham Palace; the Earl of Radnor 26, a choice collection in itself; the Duke of Sutherland 10; the Duke of Devonshire 7; Earl of Darnley 8; the Marquis of Lansdowne 8; the Earl of Mount Edgcumbe 6; the Duke of Westminster 6; the Baroness Burdett-Coutts 5; the Rt. Hon. W. Cowper-Temple 6; Sir W. G. Armstrong 5; Mr. Bingham Mildmay 12; Mr. Fuller Maitland, Mr. Wm. Wells, and Mr. Lewis Fry 6 each, and many other noted collectors in nearly equal proportions. A selection of the best pictures from our chief private collections thus brought together for leisurely study and comparison could not fail to be instructive as well as interesting. And its value grew upon you as you studied it. Apart even from the works of the great old masters, which were many and fine, there was quite a delightful series of our own older painters. Not only was the range wide but of several of the masters the specimens were numerous. Thus of the inexhaustible and always instructive Reynolds there were no fewer than 30 examples; of Gainsborough 15; of Hogarth 5; of Romney 6; Opie 4; Sir Thomas Lawrence 3. Old John Crome had 7 pictures, Callcott 3, Wilkie 2; and there were 3 by that erratic genius Fuseli, 3 by Morland, and others by Wilson, Turner, Etty, Constable, Stothard, Stark, Nasmyth, and many more. The history of English portraiture, at least from the reign of Charles I, might have been pretty well traced from this exhibition alone. First there was Vandyck, in whom modern English portraiture may be said

to have originated, with some 8 or 9 pictures, and among them an early and somewhat hard portrait of Charles's nephew, Prince Maurice, a less formal one of Prince Rupert, and one of Charles's daughter Elizabeth, who met an early death in captivity—all the property of Earl of Craven; the Duke of Devonshire's portrait of the first Earl of Burlington, the Duke of Sutherland's of Thomas Howard, Earl of Arundel, the famous collector, and the Earl of Radnor's two noble portraits of the Countess of Monmouth and Catherine, Countess of Chesterfield. Rubens did not paint many English portraits, but his portraits were highly prized by Charles and his court, and studied, there can be no doubt, by English portrait painters; and in this exhibition were two of his most famous heads—the painter himself in his great Spanish hat, and his second wife, Helena Forman, both from Windsor Castle. Lely had only one portrait, the not very modest-looking Duchess of Cleveland; and Kneller a nameless one; and then came a halting and imperfect but still tolerably continuous line of Englishmen, beginning with John Greenhill, examples of whose pencil are now far from common, and who had a solidly painted and manly portrait of the learned Seth Ward, Savilian Professor of Astronomy, and Bishop successively of Exeter and Salisbury—the portrait being lent by the Corporation of the latter city. We cannot follow the line, and only adduce the illustration by way of showing how much more may, with a little consideration, be learned from these Winter Exhibitions than appears from a hasty glance. Passing from the opening to the culminating point of English portrait art in Sir Joshua Reynolds—and there was a portrait of Lady Catherine Parker by Thomas Hudson, Reynolds's master, to mark the gloom from which he emerged—we had the exquisite portraits of Mrs. Bouverie and her child, and of Miss Morris as Hope nursing Love; and the children of the first Lord Barrington, as samples of the way in which children from their mother's knee till expanding into full-grown youth were painted by the prim old bachelor as children were never painted before or since. Mrs. Abington biting her thumb, and Kitty Fisher dissolving the pearl, showed how he could paint "saucy hizzies" as well as sober matrons. The fine intellectual head of Archbishop Markham and the placid self-satisfied "citizen of credit and renown," John Paterson, the magnificent portrait of Lord Chancellor Thurlow in his State robes—looking wiser than anybody ever was—and the noted group of John Dunning Lord Ashburton, William Shelburne Marquis of Lansdowne, and Col. Barré, testified to his power, unapproached in recent times, of painting intelligent men. Gainsborough's men were of inferior mark, but there were some of his women grace itself—the somewhat stately Lady de Dunstanville; the pretty "Cottage Girl," evidently a portrait of some dainty young lady masquerading in peasant's attire and not over anxious to maintain the disguise; Anne, the witching wife of the second Earl of Radnor; a courtier's portrait of plain old Queen Charlotte; and a more fascinating one, though only

a sketch (lent, like the last, by the Queen) of the lovely and unhappy Perdita (Mrs. Robinson).* But the picture which more than any other showed Gainsborough's supremacy of *charm* (that indescribable something, beyond even grace, which nothing can describe and no other word suggest), was that catalogued as "Ladies walking in the Mall of St. James's Park," of which Sir John Neeld is the enviable possessor, and which, more than any other picture of Gainsborough's painting, more than almost any other picture here exhibited, we should like to see in the National Gallery, a picture which painters who now-a-days pourtray (or libel) our divine fair, would do well to make the object of long, patient, and devout worship. There were other good portraits of ladies—the Countess of Sutherland, the bright-eyed Mrs. Carew, the graceful Countess of Carlisle, and Nelson's Lady Hamilton, by Romney; the grandiose Mrs. Siddons, by heavy-pencilled Hamilton, and pretty saucy Peg Woffington, by Hogarth the inimitable. Four portraits of David Garrick furnished an uncommon opportunity of forming an estimate of the man, and of comparing the styles and capacities of the portrait painters of his time. First there was the curiously characteristic portrait by Hogarth, which some of our readers may have seen at Windsor Castle, in which the actor-author is seated in dreamy mood, while his wife, who has crept stealthily behind his chair, is taking from his hand the pen with which he has just completed his "Prologue to Taste." Garrick is unmistakably true, but Mrs. Garrick delightful: if he had painted no other female face this would have sufficed to shame those who said that Hogarth was no painter. Reynolds's portrait was true and characteristic, but hardly one of his best. Gainsborough's—the Stratford-on-Avon commemoration portrait presented by Garrick to the town after the masquerading there in 1769, and lent for exhibition by the Corporation—has a very theatrical air, but Mrs. Garrick pronounced it the best portrait ever painted of her Davy. The fourth was Dance's, prosaic enough to please anybody. In it the great actor—in a grey coat and in profile—was figured contemplating the medal of Shakspere struck in commemoration of the jubilee, and was therefore a year or two later in date than Gainsborough's.

This is not the place, or we should have liked to notice the extension of the National Gallery, the appearance of the collection now that for the first time all the national pictures have been brought together in a home worthy of them, and particularly the important addition made by the munificent bequest of Mr. Wynn Ellis. As it is, we can only recommend our readers to visit the gallery whilst it retains its primal freshness. And not less strongly do we recommend a visit to the splendid collection of pictures from Althorp so liberally lent by Earl Spencer for temporary exhibition at South Kensington.

THE MUSIC OF THE YEAR 1876.

THE musical record of each year as it passes, although furnishing plentiful evidence of the earnestness of the professor and the enthusiasm of the amateur conveys with ever-increasing force the lesson which is taught with no uncertain voice in almost every other phase of nineteenth century life—that permanent and perfect work is being sacrificed to the exigencies of the hour. In some cases, as was suggested in the "Companion to the Almanac for 1876," composers are overworked as teachers, and cannot afford to devote themselves to the creative function when the means of existence are more easily obtained by the giving of lessons, the conduct of classes, or perhaps by concert-room performances, while in other instances the golden bait of the publisher, who cares more for the presence of a popular name on a title-page than for the actual value of the work, tempts the composer to write for the moment, and to sacrifice his ultimate reputation and position in the artistic commonwealth to the momentary demands of the public. Illustrations under both heads might readily be supplied, but in all probability the reader will, without difficulty, fill in the names for himself, and in any case it is not too much to say that the leading representatives of English music belong respectively to the classes we have indicated. And of many other English composers the same must be said, so that, instead of being able to point year after year to works which are worthy to take their place beside those of the masters of the past, we are compelled to rest satisfied with a comparatively small contribution to our shelves, and, even then, to accept workmanship of an order absolutely inferior to that which we have a right to expect. Music, in fact, suffers in this country from that very progress in its practical cultivation which is in some respects so desirable, and the consequence is, that while we are in a transitional state, and are passing from comparative popular ignorance of the art to a moderate acquaintance with and appreciation of its beauties, the musician on the one hand is almost compelled by force of circumstances to become a teacher, while on the other the education of the people is not sufficiently advanced to cause them to demand high class works to such an extent as to make it a remunerative task to supply them. Whether, as musical education becomes more general, the condition of affairs will improve until not only the teacher will be less necessary, but the composer will find a market for the best of his writings, remains to be seen, and although there are those who affirm that the English lack the "je ne sais quoi," which makes a German instinctively a worshipper of Mozart or Beethoven, while the Briton is content with a homely ballad, there are not wanting signs of an increasing appreciation of the good and true sufficient to justify the anticipation of still better things. At any rate, that the music of the future must to a very great extent depend upon the teaching of the present is obvious, and if tastes are formed on good models,

if the child's first pieces for the pianoforte are taken from a "Schumann Album," or from some kindred work, instead of from a collection of worthless, albeit tuneful adaptations of negro melodies and operatic gems; if our young choristers are led to practice the healthy part music, which, whether sacred or secular, is the noblest legacy of our musical fathers; and, above all, if the art is taught in an intelligent fashion the enforcement of its laws being preceded by the inculcation of sound principles, we shall soon arrive at a healthier condition of affairs.

This being so, it follows naturally that our first inquiry, in looking at the work of the past year, must be directed to the provisions for musical education, and, in this matter, the progress of 1875 has been satisfactory. At the Royal Academy of Music the number of pupils has risen to the highest point ever reached since its foundation in 1822, and at the presentation of the prizes, on the 21st of July—a duty gracefully performed by Mdlle. Nilsson—the Principal was able to announce that there were 336 students on the books. The number of scholarships, giving the right to free or partly free education, has been considerably increased, and, in addition to the Goss Scholarship recently established by the exertions of the College of Organists, there is now a Balfe Scholarship to swell the goodly list. At Kensington, the National Training School, the objects of which were fully detailed in the "Companion to the Almanac for 1876," is now an established fact, the building munificently presented by Mr. Freake having been opened, without ceremony, for the reception of students on the 17th of May, by the Duke of Edinburgh and the Duke of Connaught. Upwards of fifty scholars were entered on the books on the opening day, the necessary funds for their education having been supplied by public bodies, by subscriptions in various localities, and by individuals. In each case the scholarship had been first thrown open to competition. The training school has for its Principal Dr. Arthur Sullivan, who is assisted by several able professors. As to the fears which have been more than once expressed, in regard to the evil effects of attempting to maintain two national music schools in a country which has hitherto shown but little disposition to support even one such institution in a satisfactory manner, it cannot be said that they have been altogether removed, and the utmost that can be asserted on the subject is that, as the directors of the Royal Academy have never appealed to the country with the energy which the promoters of the younger institution have shown, the funds obtained would probably have been lost, if the Society of Arts had not taken up the work. Shortly after the opening of the Kensington school, the Society intimated its intention of discontinuing the examinations in elementary music, which it had conducted for some years, with Dr. Macfarren and Dr. Hullah as the examiners, and at which a considerable and increasing number of candidates had gained certificates. On this announcement being made, the Editor of the "Choir" suggested that the examinations should be taken up by the Council of Trinity

College, London, and this course has been adopted, although the Society of Arts has again altered its plans, and proposes to hold its examinations as in previous years, with Dr. Hullah as examiner. Trinity College has commenced work as an educating body, instead of simply conducting examinations and granting certificates. In this and other directions, its progress has been very marked during the past year. At the London centre, there have been upwards of sixty students on the books, and the diploma of licentiate, granted after examination, has been taken by upwards of seventy musicians, while, in addition, the college has enrolled a body of associates who have also passed its examinations. The educational department of the college includes classes and lectures on choir management, harmony, counterpoint, form in musical composition, and other kindred subjects, and, as the evening is the time of study, an important means of acquiring a thorough musical education is opened out in a direction where it has hitherto been entirely wanting. As a preliminary to the acquirement of its musical diplomas, the college requires the candidates to pass a general examination of a simple character, and to enable students to prepare for this or to perfect their education in other ways, there are classes in classics, mathematics, and other subjects. A musical college, open to the general public, is thus at last provided in the metropolis, and branches are being established in various parts of the country, as, for instance, at Dublin, Manchester, and Cambridge. The institution, it may be added, is definitely connected with the Church of England, but its examinations and classes are open to the members of other religious bodies. At the universities of Oxford and Cambridge, the increase in the number of candidates for the degrees in the faculty of music, noted in the previous year, has been fully maintained, and, at last, the University of London, in response to a petition suggested by the Council of Trinity College, and largely signed, has decided to act on the powers possessed under its charter, of granting degrees in music. The regulations for the examinations have just been announced, and it appears that matriculation will be required in this as in the other faculties, and thus at London, as at Dublin, the musical graduates will have to pass a severe test as regards general education. At Oxford, where candidates have hitherto only been required to place their names on the books of one of the colleges or halls, and to produce a testimonial from several graduates, a movement is being made in the same direction, and a committee has been appointed to settle some system of previous examinations. If this committee carries out its intention, Cambridge will be the only university where musical honours can be obtained without the passing of a preliminary general examination. In connection with the universities, it is worthy of note that Cambridge has conferred its highest musical degree upon Sir John Goss and Mr. Arthur Sullivan, a distinction which, it is needless to add, was in both cases eminently deserved. At the College of Organists, the work of the year has included a valuable series

of afternoon lectures, including discourses on the "Organ," by Mr. Henry Bryceson; on "Bach's Fugues," by Mr. James Higgs, Mus. Bac., Oxon; and on "Church Music," by Mr. Cooper and Mr. Gladstone. At the London Institution, Professor Ella has delivered his annual discourses, addressed more immediately *ad populum*, his chief subject being the Opera, with illustrations, admirably rendered by a chamber band and choir, from Spohr's "Jessonda," and other works. Musical lectures have also formed a part of the scheme of the School of Art at the Alexandra Palace, and at the Royal Institution, which seems to have been given over to the adherents of Herr Wagner, lectures have also been delivered. Nor must we omit to mention in this connection the second session of the Musical Association, which has continued its meetings at the Beethoven Rooms, in Harley Street. Although, strictly speaking, pledged to "the investigation and discussion of subjects connected with the art and science of music," the association has gone somewhat further afield, and the first paper read by the honorary secretary, Mr. Charles K. Salaman, was upon "Musical Criticism," a topic which evoked a lively and, at times, a somewhat heated and personal discussion. More completely in keeping with the scheme of the Association was the second paper, by Dr. William Pole, on "The Graphic Method of Representing Musical Intervals," or, in other words, on the representation of musical intervals to the *eye*, so as to convey ideas of comparative magnitude precisely analogous to the impression which the intervals make on the *ear*. The third paper, contributed by the Rev. Sir F. A. Gore Ouseley, Bart., in the form of "Considerations on the History of Ecclesiastical Music in Western Europe," besides presenting an interesting historical *résumé* of the subject, induced a discussion on the relative merits of Gregorian and Anglican chants, and on the use of the orchestra in the accompaniment of Anglican services, the Professor expressing himself as decidedly in favour of the modern as distinguished from the ancient chants, and advocating strongly the use of the full band in churches, under proper conditions. Mr. Victor de Pontigny, at the fourth meeting, read a paper on Kettledrums, "the only musical instrument of the Drum family," as he termed it, in which, after giving an exhaustive account of its form and character, the author commented upon the absurdity of imagining that the drum requires little musical ability or knowledge on the part of the performer, the converse being so much nearer the truth that even the late Jenkinson, the chief drummer of his day, once came in a bar too soon, in a chorus of "Joshua," and was so mortified that he is said to have inflicted summary punishment on himself by beating his own head with his sticks. Mr. de Pontigny's practical conclusions pointed to the necessity for uniformity in the make of these instruments. At the same meeting, a second paper, appealing alike to composers and instrumentalists, was read by Professor W. H. Monk, of King's College, on "Some Points in the received Method of writing an Orchestral Score," in which the

author advocated the writing in the full score of the parts played on "transposing instruments," such as clarinets, horns, trumpets, and drums, at the pitch at which they are played. Upon the evils of the present system the Professor strongly insisted, as not only involving needless difficulties to the player, but to the readers of scores, and he argued that, to place before the eye the note to be produced, represented at its proper pitch, whether producible by any voice of the vocal quartet or by any instrument, would not only assist amateurs, but would involve no departure from scientific principles. Dr. Stone, at the fifth gathering of the session, read a paper on "Standards of Musical Pitch;" at the sixth, Lord Rayleigh read a paper on "Our Perception of the Direction of a Source of Sound;" at the seventh meeting, Professor W. G. Adams described "The Musical Inventions and Discoveries of the late Sir Charles Wheatstone;" and, at the last meeting, Mr. Lennox Browne read a paper on "Medical Science in Relation to the Voice as a Musical Instrument." The difficulty of the Association will, it is obvious, lie in the direction of combining fidelity to its original principles with a range of subjects sufficiently wide to attract the general body of musicians, and the very incomplete character of the discussions on several occasions during the recent session, when many eminent men were present whose opinions would have been received with the utmost interest, suggests that members do not fully realize that the *raison d'être* of the Association is not simply the reading of papers, but the investigation and *discussion* of the subjects which are introduced.

Turning from the educational side of our subject to the year's music-making in the practical sense of the word the first event in point of interest and of magnitude, is unquestionably the festival at Bayreuth, at which Herr Wagner produced and performed three times his Trilogy, intended to represent in the most complete form his conception of what music ought to be, to do,—and some persons would be inclined to add, to suffer—in combination with the sister art of poetry, the two arts on this occasion being united in the work of the poet-musician, for the Bayreuth hero was his own librettist. Never before in the history of music has there assembled a more enthusiastic or more willing auditory, and never has a composer in his lifetime been permitted to enjoy more completely the fruition of his own work, even down to the minutest details of the arrangements within the house which included the banishment of the orchestra to an invisible chamber. Of the success of the festival, despite the offensive character of the plot on which the dramatic interest of the trilogy turned, there has been no dispute, admitting the justice of the author's premises, but those who, while holding clear views of the beauty of music in the sense in which the term has hitherto been understood, simply went willing to be convinced, came away as they went, and in scarcely a single case has there been a conversion of any importance to the creed of the musical neologian. In fact, if the truth be told, the view

of those best able to judge is that if Wagner had not been his own prophet, as well as his own poet and composer, he would never have gained the position which for a fortnight in August he occupied in the attention of Europe. That his pretensions to be regarded as the originator of a new school, which is likely to supersede the old, have been supported by the calm verdict of dispassionate critics, cannot be asserted, and while admitting the importance of the Festival as a proof that the love of music and of fair play has so far advanced as to secure an almost unequalled trial of a great work in the presence of an audience assembled from all Europe, it is impossible to add that any greater result has been arrived at than that Herr Wagner is an earnest and powerful musical thinker. At the other great German Festival of the year, the Lower Rhenish musik-fest, held at Whitsuntide, at Aix-la-Chapelle, under the direction of Herr Ferdinand Breunung, with a band of 124, and a chorus of 502 performers, the chief works given were Handel's "Solomon," as originally scored, and with Mendelssohn's organ part; Brahms' "Triumflied" for eight part choir, and Schumann's Cantata, "Des Sangers Kuch." On the third day, at the artists' concert, which owed its origin to the introduction of a supplementary performance by Mendelssohn in 1833, there was an interesting and varied programme, including an overture by the conductor, who also played Mendelssohn's organ sonata in F minor, and pianoforte solos by Mdme. Essipoff, the Russian artiste who has gained such fame in this country.

In England as in Germany, the year has been emphatically a year of festivals, and the concurrence of the triennial music meeting at Birmingham and Bristol, and the festival of the Three Choirs at Hereford, served to give a musical tint to the first months of autumn. At the great midland town in the last week in August Sir Michael Costa again conducted the festival at which his services were once declined when in early years he was sent down to direct a foreign composer's work, but where he is now the accepted master of the situation. The programme contained two works of importance by English composers, "the Resurrection," by Professor Macfarren, and "the Corsair," a cantata, by Mr. F. H. Cowen; two works by the Danish composer Niels Gade, "Zion," and "the Crusaders," both in the cantata form; and a "scene" more dramatic than musical, and more forcible than devotional, by Herr Wagner, entitled "The Holy Supper," the conception of which fully explained the possibility of the rumour that the composer had profanely intended to make the Saviour of the World the hero of his trilogy. At Hereford, in the second week in September, the only recent work presented was Mr. J. F. Barnett's oratorio, "The Raising of Lazarus," but the programme included Gounod's "St. Cecilia" mass in G, with a new movement, a work but little known even in the metropolis, and almost entirely unknown in the provinces. For the Bristol Festival in October, the Committee wisely secured Mr. Charles Hallé's Manchester band, which has acquired

a fame in the north rivalling that of the Crystal Palace orchestra in the south, and with the finished choir of local singers, trained by Mr. Alfred Stone, and the clever organist, Mr. George Riseley, who, since the last festival was held, has succeeded the late Mr. Corfe at the Cathedral, the executive department was complete. The programme was strong in choral works, including Mendelssohn's "Elijah," Verdi's "Manzoni Mass," Handel's "Israel in Egypt," Spohr's "Fall of Babylon," Beethoven's "Engedi," Mendelssohn's "Hymn of Praise" and the "Messiah," while due opportunity was given to the fine band to display its powers in separate work by the performance of the "Pastoral" symphony, the "Jupiter," and Schumann's in B flat, with the "Hebrides," "Jessonda," "Oberon," "Egmont," and "Tannhäuser" overtures. Such a scheme has seldom been surpassed in attractiveness, while in execution and completeness, especially as regards the effect of the organ work, the western festival compared most favourably with the Midland.

In the London musical season the Italian Opera assumed its usual fashionable prominence. The work of the year will be seen at a glance from the following table :—

		Covent Garden.	Drury Lane.
		Times.	Times.
Mozart ..	"Don Giovanni"	5	7
	"Nozze de Figaro"	2	
	"Il Flauto Magico"	2	
Beethoven ..	"Fidélio"	..	1
Donizetti ..	"L'Elisir d'Amore"	4	
	"Don Pasquale"	3	
	"Lucia di Lammermoor" ..	3	2
	"La Figlia del Reggimento" ..	1	1
	"La Favorita"	1	
	"Lucrezia"	..	3
Rossini	"Il Barbière"	3	3
	"Guglielmo Tell"	4	
	"Semiramide"	..	4
Verdi	"Traviata"	5	2
	"Trovatore"	2	1
	"Il Ballo"	4	
	"Rigoletto"	3	1
	"Aïda"	5	
Meyerbeer ..	"Huguenots"	2	3
	"Dinorah"	3	
	"L'Etoile du Nord"	4	
	"L'Africaine"	2	
	"Robert le Diable"	..	3
Bellini	"Sonnambula"	1	2
	"Norma"	..	2
	"Puritani"	2	
Auber	"Fra Diavolo"	5	
Gounod	"Faust"	2	10
	"Roméo e Giulietta"	1	
Flotow	"Marta"	3	3
Thomas	"Hamlet"	1	
Wagner	"Lohengrin"	3	5
	"Tannhäuser"	8	
Ricci	"Crispino é Comare"	1	

Performances (C. G.), 85, (D. L.) 53; Operas (C. G.), 29, (D. L.) 17; Composers (C. G.), 12, (D. L.) 10.

At Covent Garden, Mr. Gye retained the services of Signor Vianesi and Signor Bevignani as joint conductors, and at Her Majesty's Opera at Drury-lane, where Mr. Mapleson once more received his friends, pending the completion of the National Opera House, Sir Michael Costa filled his accustomed place. At neither house was there any effort to emulate the glories of the past by the production of new works.

The interest of the season, as far as novelties were concerned, centred in the Royal Italian Opera, where "Tannhäuser" and "Aïda" were given for the first time in England, for at Her Majesty's Opera there was not a single new work, and even the promise in the prospectus, of a repetition of Balfe's "Il Talismano" was never fulfilled. In new artistes of merit, both companies were alike deficient, and both, as a natural consequence, depended upon established favourites for their success. At Covent Garden, Mdme. Adelina Patti, Mdme. Albani, and Mdlle. Marimon, and at Drury Lane Mdlle. Nilsson, Mdlle. Varesi, and Mdme. Trebelli-Bettini sustained the real weight of the season in a manner beyond reproach, but in the ranks of the male singers there was considerable weakness. In English opera, or opera in English, Mr. Carl Rosa's too short season at the Princess's Theatre in the autumn of 1875, was decidedly successful with Mr. Santley as a member of his staff; and encouraged by the popularity of his performances, he has given a second London season at the Lyceum Theatre during September, October, and November with a still stronger body of artistes and a programme which includes a new opera by Mr. F. H. Cowen, entitled "Pauline," specially written for the company; Nicolo Isouard's "Joconde;" Beethoven's "Fidélio," as originally written, without recitatives; Adolphe Adam's "Giralda" for the first time in England, and an English version of Wagner's "Flying Dutchman." With such a scheme, the season, which is in progress as we write, can scarcely fail to be successful, and to add largely to the reputation Mr. Rosa has already made both in the United States and in this country. If, in fact, he could secure permanently one of our best London houses, the managers of the Italian Opera would have to look to their laurels. His aim has ever been to give an effective *ensemble*, to secure a good band as well as a good chorus, and not to starve the company in order to reward the principals. His chief singers are fully equal to their work, but it is because they are well supported that the performances of the company have gained such deserved commendation on artistic grounds. Of opéra bouffe—a term which has in reality no English equivalent, and which represents a form of entertainment so essentially French that it must be performed in French by French actors and actresses to be thoroughly appreciated—there has been a plentiful supply at the minor theatres of the metropolis, throughout the year, Offenbach, Lecocq, and Hervé, finding a strong body of sympathisers, even when robbed of the vivacity of the French actresses

and the piquancy of the French dialogue. That there is, however, a slight falling off in the number of houses devoted to this class of performances it is satisfactory to note for anything less healthy, musically or morally, than the average French opera of this school, with its plot rendered still more bald and offensive when "done into English," it would be impossible to imagine. An effort to provide something equally bright and better suited to the national taste, has been made with some success by Mr. Frederick Clay and other writers, while of the pleasant and thoroughly English entertainments which may be described as chamber operas, Mr. and Mrs. German Reed have kept up a plentiful supply. In this class of composition there is an excellent field for the efforts of our young English writers, who would do well to devote their attention to it in preference to the writing of cantatas which they so generally adopt when they go beyond the production of fugitive songs.

In the concert-room the record of the year shows that the Crystal Palace is still in the first rank as regards the presentation of new or unknown works for the orchestra, and still, as in the past, there is a noticeable tendency to favour the writers of the German school. Thus in the twenty-six programmes from October 1875 to May 1876 we find among the absolutely new works Raff's symphony No. 4 in G minor; pianoforte concertos by Rubinstein (No. 4 in G), by J. F. Barnett (in D minor), and by Tschaikowsky: violin concertos by Henry Holmes and Hégar; a violoncello concerto by Raff; overtures by Wingham in E, "Les Muses," by Alfred Holmes, the "Dream of Happiness," by C. E. Stephens, "Love's Labour Lost," by Cusins, "Richard the Third," by Volkmann, "Der Fliegende Hollander," by Wagner; Bach's cantata "God's Time is the Best," Prout's "Magnificat," Pierson's prologue to "Macbeth," a selection from Rubinstein's "Feramors" and Brahms' cantata "Rinaldo." Among the standing dishes of the season were the whole of Beethoven's glorious "Nine," works which are never heard to greater advantage than at Sydenham, where, thanks to the careful and clever analyses of Dr. Grove, they are now thoroughly appreciated. The lack of financial success which has, we regret to say, hitherto marked the Company's operations has happily not been allowed, so far, to interfere with the progress of these concerts, of which English musicians are justly proud; and if we could add to this brief note of their chief features a sketch of the daily performances, it would give still further cause for gratitude to Mr. Manns the ever-painstaking conductor, and to all who are associated with him. Among other good things done during the year at Sydenham was the performance of the "Œdipus ad Colonos" with Mendelssohn's music for the first time on the English stage. At the Alexandra Palace, under the direction of Mr. H. Weist Hill, one of the foremost of our English violinists, an efficient orchestra has been established, and much good work has been done, including the revival of Handel's "Esther" for the first time since 1757, and the presentation for

the first time in England of the too-long neglected works of the modern French school, including an orchestral suite of M. Massenet and other graceful compositions. At Muswell Hill, as at Sydenham, organ recitals are given day by day. The concerts of the Philharmonic Society have not been altogether without reproach, partly on the ground that the directors have neglected to encourage rising English composers by inviting them to write works for performance, but chiefly because an exclusive share in the programmes has been given to foreign composers. With the exception of a brace of overtures by Bennett and an overture by the conductor Mr. Cusins, the scheme for the season was mainly German with an infusion of French and Italian works. When it is added that the majority of the principal artistes engaged were also foreigners, it is obvious that there is some reason for the complaint which has been made, and which the directors will do well to take into consideration. The chief novelties of the season were the MS. overture "The Merry Wives of Windsor," by Bennett, and Rubinstein's dramatic symphony in D minor op. 95. At the New Philharmonic Concerts, among the novelties given under Dr. Wylde's beat were a symphony in G minor by Gernsheim, a professor well known at Rotterdam, and Radecke's overture "Am Strande." Among the chamber music performances of the year, the matinées of the Musical Union were kept up with unflagging interest, no fewer than seven eminent foreign pianists assisting during the season, including Herr Breitner, a debutant from Trieste. The works given for the first time included a quartet in D op. 11, by the Russian composer, Tschaikowsky and a quartet in B flat by M. Saint-Saens, who was one of the artistes. At the Monday and Saturday Popular Concerts were heard for the first time a pianoforte sonata in C minor No. 8, by Schubert, a string quartet of Haydn, in F major, op. 74, and a sonata for violoncello by Geminiani. The pianoforte sonata by Dr. Macfarren in G minor was also virtually a novelty, as it had only been heard once before at a concert given by Miss Zimmermann. In addition to these excellent entertainments, Herr Coenen contributed a series of Chamber Music Concerts, at which several important new works were produced, and the pianoforte recitals of Mdme. Schumann, Mdlle. Krebs, Mdlle. Mehlig, Mdme. Essipoff, Herr Rubinstein, Mr. Charles Hallé, and Signor Rendano, filled up many afternoons. Mr. Hallé went through the whole of Beethoven's sonatas, which he had not given consecutively for five years, thus imparting an historical and educational interest to his concerts. The playing of Herr Rubinstein created such enthusiasm as is but seldom witnessed in a London concert-room; and it may be safely affirmed that no artist has ever been more warmly greeted by connoisseurs in this country. In the Choral Concerts of the year, the Sacred Harmonic Society, the only society now giving oratorios, contented itself with the stock pieces of its repertoire, and Mr. Henry Leslie's choir dealt chiefly with the smaller works, in the execution of which it still remains unrivalled.

By the energy and enterprise of a body of distinguished amateurs, Bach's grand B minor mass was twice finely performed with Herr Otto Goldschmidt as conductor, and at Mr. Walter Bache's annual concert Liszt's "St. Elizabeth" was efficiently rendered. At another private concert, Madame Sainton-Dolby introduced her new cantata "St. Dorothea."

To allude to the work of the year in the field of church music would occupy more space than remains at our disposal, and we must therefore content ourselves with recording the introduction of Purcell's grand Te Deum in D at the College of Organists' Festival at St. Paul's Cathedral on St. Cecilia's Day—a revival of the commemorations once held in Stationers' Hall—and the rendering of the Dettingen "Te Deum" at the service of Thanksgiving at the Cathedral after the return of the Prince of Wales from India. So too with regard to the musical performances in the provinces, it is impossible to do more than note the continued success of Professor Oakeley's work at Edinburgh, appropriately recognised by the recent knighthood of the Professor on the occasion of Her Majesty's visit to unveil the Albert Memorial; the work of Sir R. P. Stewart at Dublin, where Verdi's Requiem was brought to a hearing, and where Sir Robert gave an important course of lectures in the spring on National Musical Instruments; the performance of Brahms' "Requiem" at Cambridge; and the concerts directed by Mr. Charles Hallé at Manchester, and by Sir Julius Benedict at Liverpool. At Brighton in the spring Herr Kühe held his annual festival, and at Leeds and at Liverpool the organ recitals of Dr. Spark and Mr. Best have been largely attended.

The obituary of the year includes an unusual number of eminent musicians—the organists, Dr. Wesley and Dr. Gauntlett, Mr. Angel, Mr. Corfe, and Mr. George Cooper; C. E. Horsley, composer and conductor; T. M. Mudie, the pianist and composer; Alfred Holmes, the composer; Paque, the violoncellist; Kerr Gedge, the tenor singer; M. Deloffre, the pianist; M. Coussemaker, the critic and historian; the Rev. Dr. Dykes, the hymn-tune writer; Felicien David, the French composer; Mdme. Pelletan, the editor of Glück's operas; and Dr. Rimbault, the learned musical antiquarian and editor.

The additions to our musical literature have been few and far between, the most important works issued being Novello and Ewer's "Dictionary of Musical Terms," edited by Dr. Stainer and Mr. W. A. Barrett; Carl Engel's "Musical Myths and Facts;" a translation of the "Life of Mendelssohn," by Lampadius; Profes;or Ritter's "History of Music" (an English reprint of a valuable American work); a new edition of Dr. Hullah's admirable "Royal Institution Lectures;" and a second edition of Graeme's "Memoir of Beethoven." The publication of "Concordia," a weekly musical journal, issued by Novello, Ewer, and Co., has been discontinued, after a year's trial.

TABLE OF ALL THE PUBLIC GENERAL ACTS

PASSED IN THE THIRD SESSION OF THE TWENTY-FIRST PARLIAMENT OF GREAT BRITAIN AND IRELAND,

39 AND 40 VICTORIÆ. A.D. 1876.

(The Acts are given in the order in which they were passed, the number denoting the chapter. An Abstract of those Acts distinguished by an asterisk is given in the pages following this table, which contain a classified epitome of the more important statutes passed during the year.)

1. An Act to raise the sum of £4,080,000 by Exchequer Bonds.
(Applies 29 & 30 Vict. c. 25.)

2. An Act to apply the sum of £4,080,000, out of the Consolidated Fund, to the service of the year ending on the 31st of March, 1876.

3. An Act to extend the Time for the Epping Forest Commissioners to make their Final Report.
(Extends time limited by 38 & 39 Vict. c. 6, for Commissioners' Final Report.)

4. An Act to apply £10,029,550 out of the Consolidated Fund to the service of the years ending the 31st of March, 1875, 1876, and 1877.

5. An Act for enabling a further Sum to be raised for the purposes of the Telegraph Acts, 1868 to 1870.
(Applies 31 & 32 Vict. c. 110, 32 & 33 Vict. c. 73, and 33 & 34 Vict. c. 88.
Amends 32 & 33 Vict. c. 73.)

6. An Act to amend the Law relating to the Stamping of Policies of Sea Insurance.
(Amends Inland Revenue Act, 30 & 31 Vict. c. 23.
Applies section 16 of Stamp Act, 1870, 33 & 34 Vict. c. 97.)

7. An Act to amend the Law relating to certain Appointments to the Council of India.
(Amends 32 & 33 Vict. c. 97; Government of India.)

8. An Act for punishing Mutiny and Desertion, and for the better payment of the Army and their Quarters.
(Applies 26 & 27 Vict. c. 57; Regimental Debts.
Amends 33 & 34 Vict. c. 67; Army Enlistment.)

9. An Act for the Regulation of Her Majesty's Royal Marine Forces while on shore.

*10. An Act to enable Her Most Gracious Majesty to make an addition to the Royal Style and Titles appertaining to the Imperial Crown of the United Kingdom and its Dependencies.
(Recites 39 & 40 Geo. 3, c. 67: Act of Union.
" 21 & 22 Vict. c. 106; Government of India.)

11. An Act to amend the Act of the 7th and 8th years of Her Majesty, chapter 44, relating to the Formation of quoad sacra Parishes in Scotland.

12. An Act to assimilate the Law of Scotland to that of England respecting the creation of Burgesses.
(Amends 33 & 34 Vict. c. 42; Petty Customs (Scotland) Abolition.)

13. An Act to prevent the Administration of Poisonous Drugs to Horses and other Animals.
(Applies Summary Jurisdiction Acts.)

14. An Act to extend the provisions of the Exchequer and Audit

Departments Act, 1866, to the Accounts of the Commissioners for the Government of the Royal Hospital at Chelsea.

(Extends 29 & 30 Vict. c. 30 (Exchequer and Audit Departments) to Accounts of Chelsea Hospital.
Repeals sections 40 and 41 of 2 & 3 Will. 4, c. 53; Army Prize.
Amends 5 & 6 Will. 4, c. 35; Paymaster-General.)

15. An Act to apply the sum of £11,000,000 out of the Consolidated Fund to the service of the year ending the 31st of March, 1877.

16. An Act to grant and alter certain Duties of Customs and Inland Revenue, and to amend the Laws relating to Customs and Inland Revenue.

(Repeals section 14 of 6 Geo. 4, c. 81, as to Wine Licenses.
Amends 3 & 4 Vict. c. 17, 23 & 24 Vict. cc. 27, 107, and 24 & 25 Vict. c. 91, as to Wine Licenses.
Restricts section 19 of 32 & 33 Vict. c. 14, as to term "male servant."
Repeals § 32 of 5 & 6 Vict. c. 35; § 6 of 23 & 24 Vict. c. 14, Part IV of 35 & 36 Vict. c. 20, and § 6 of 38 & 39 Vict. c. 23, as to Income Tax.
Repeals § 19 of 7 Geo. 1, st. 1, c. 27, 49 Geo. 3, c. 32, part of 6 Geo. 4, c. 9, and 6 & 7 Will. 4, c. 97; Duties on Offices and Pensions.)

17. An Act to amend the Partition Act, 1868.

(Amends 31 & 32 Vict. c. 40.)

18. An Act to incorporate the Solicitor for the affairs of Her Majesty's Treasury, and make further provision respecting the grant of the administration of the Estates of deceased persons for the use of Her Majesty.

(Repeals 15 & 16 Vict. c. 3; Intestates' Personal Estates.
Re-enacts § 2 of said Act as to Solicitor of Duchy of Lancaster.)

19. An Act to amend the Law relating to Salmon Fisheries in England and Wales.

(Amends 36 & 37 Vict. c. 71.)

20. An Act to facilitate the Revision of the Statute Law by substituting in certain Acts, incorporating Enactments which have been otherwise repealed, a reference to recent Enactments still in force.

(Substitutes Summary Jurisdiction Act for repealed Act 7 & 8 Geo. 4, c. 30, in certain sections of the Inclosure Acts 11 & 12 Vict. c. 99, 12 & 13 Vict. c. 83, 15 & 16 Vict. c. 79.
Substitutes certain enactments for repealed enactments in 12 & 13 Vict. c. 25; Treaty with Portugal for Apprehension of Deserters.
Substitutes Larceny Act, 1861, for repealed Act 20 & 21 Vict. c. 54, in Municipal Corporation Mortgages, &c., Act, 23 & 24 Vict. c. 16.
Substitutes Larceny Act, 1861, for repealed Act 7 & 8 Geo. 4, c. 29, in § 23 of Criminal Justice Act, 18 & 19 Vict. c. 126.
Substitutes Licensing Act, 1872, for repealed enactments in § 10 of Prevention of Crimes Act, 34 & 35 Vict. c. 112.)

21. An Act to amend the Laws relating to the Qualification of Jurors in Ireland.

(Amends 34 & 35 Vict. c. 65, 35 & 36 Vict. c. 25, and 36 & 37 Vict. c. 27.)

*22. An Act to amend the Trade Union Act, 1871.

(Amends 34 & 35 Vict. c. 31.
Brings Trade Unions within provisions of § 28 of Friendly Societies Act, 38 & 39 Vict. c 60.)

*23. An Act to amend the Prevention of Crimes Act, 1871.

(Amends 34 & 35 Vict. c. 112, as to registry and photographing of Criminals.)

24. An Act for the Relief of the Executors of Testates in Scotland where the Personal Estate is of small Value.

(Provides for expeding Confirmation to Estates under £150.
Applies 21 & 22 Vict. c. 56: Confirmation of Executors (Scotland).)

25. An Act to amend the Law in Scotland in regard to the division of Burghs into Wards.

(Amends 31 & 32 Vict. c. 102; General Police and Improvement (Scotland).
" 31 & 32 Vict. c. 108; Municipal Elections (Scotland).)

26. An Act to assimilate the Law of Scotland relating to the granting of Licenses to sell intoxicating Liquors to the Law of England.

(Applies 25 & 26 Vict. c. 35; Public-houses (Scotland).
,, 9 Geo, 4, c. 58; Sale of Beer (Scotland).)

27. An Act to authorise the Reduction of Local Light Dues.
(Empowers local authority to reduce dues in respect of lighthouses, buoys, or beacons.)

28. An Act to amend the Court of Admiralty (Ireland) Act, 1867, and confer a more extended Admiralty Jurisdiction on the Recorders of Cork and Belfast.
(Amends 30 & 31 Vict. c. 114; and confers a more extended Admiralty Jurisdiction on the Recorders of Cork and Belfast.)

*29. An Act for the Preservation of Wild Fowl.
(Amends 35 & 36 Vict. c. 78; Wild Birds Protection.)

30. An Act to amend the Settled Estates Act of 1856.
(Amends 19 & 20 Vict. c. 120; Leases and Sales of Settled Estates.)

31. An Act to grant Money for the purpose of Loans by the Public Works Loan Commissioners, and to amend the Public Works Loans Act, 1875.
(Amends 38 & 39 Vict. c. 89.
Applies section 56 of 38 & 39 Vict. c. 89 to loan to Portpatrick and Belfast and County Down Railways under 31 & 32 Vict. c. 81.
Removes doubt as to advances of money for Colombo Harbour under 37 & 38 Vict. c. 24.
Explains 38 & 39 Vict. c. 89 as to interest on loans to sanitary authorities.)

32. An Act to amend the Friendly Societies Act, 1875.
(Amends 38 & 39 Vict. c. 60.)

33. An Act for the Amendment of the Trade Marks Registration Act, 1875.
(Amends 38 & 39 Vict. c. 91.)

34. An Act to amend the Law relating to Elver Fishing.
(Amends 36 & 37 Vict. c. 71; Salmon Fishery Act, 1873.)

35. An Act for consolidating the Duties of Customs.
(Instead of all other duties and drawbacks, those in table to this Act to be paid and allowed.
Applies 18 & 19 Vict. c. 38, and 24 & 25 Vict. c. 91 as to Methylated Spirit.)

36. An Act to consolidate the Customs Laws.
(Repeals (with Savings) the following Acts and parts of Acts, viz.:—8 & 9 Vict. c. 85, ss. 2, 3; 16 & 17 Vict. c. 107, in part; 18 & 19 Vict. c 96; 18 & 19 Vict. c. 97; 19 & 20 Vict. c. 75 (except s 6); 20 Vict. c. 15; 20 & 21 Vict. c. 61; 20 & 21 Vict. c. 62; 21 & 22 Vict. c. 12; 22 & 23 Vict. c. 37; 23 & 24 Vict. c. 22; 23 & 24 Vict. c. 36; 24 & 25 Vict. c. 20, in part; 25 & 26 Vict. c. 22, in part; 26 & 27 Vict. c. 22, in part; 27 & 28 Vict. c. 18, in part; 28 & 29 Vict. c. 30, in part; 28 & 29 Vict. c. 95; 30 & 31 Vict. c. 10; 30 & 31 Vict. c. 23, in part; 30 & 31 Vict. c. 82; 31 & 32 Vict. c. 28, in part; 32 & 33 Vict. c. 14, in part; 33 & 34 Vict. c. 12; 33 & 34 Vict. c. 32, in part; 34 & 35 Vict. c. 21, in part; 36 & 37 Vict. c. 29; 37 & 38 Vict. c. 16, in part.
Applies 38 & 39 Vict. c. 13; Holidays Act Extension.
,, 54 Geo. 3, c. 158; Ports, Harbours, &c., of United Kingdom.
,, 4 & 5 Will. 4, c. 15; Office of receipt of Exchequer.
,, Common Law Procedure Acts.
,, unrepealed provisions of 56 Geo. 3, c. lxxiii, as to fund available for benefit of Customs officers, &c.
Saves certain provisions of 8 & 9 Vict. c. 90, as to reciprocity under treaties.
,, ,, ,, ,, 16 & 17 Vict. c. 107, as to cards imported.
Extends Customs Acts to British Possessions Abroad.)

37. An Act to assimilate the Law in Ireland to the Law in England as to quieting Possessions and Titles against the Crown.
(Extends to Ireland provisions of 24 & 25 Vict. c. 62, as to Prescription against the Crown.
Construes Act with 48 Geo. 3, c. 47; Recites 9 Geo. 3, c. 16; } Prescription.)

38. An Act to extend the Limits of Age up to which, with the assent of Boards of Guardians, orphan and deserted pauper Children may be supported out of Workhouses in Ireland.
(Repeals 32 & 33 Vict. c. 25; Orphan and Deserted Children (Ireland).)

39. An Act to continue certain Turnpike Acts in Great Britain, and

to repeal certain other Turnpike Acts; and for other purposes connected therewith.

(Repeals and continues Local Acts as set forth in Schedule.)

40. An Act for enabling legally qualified Medical Practitioners to hold certain Public Medical Appointments, and for amending the Medical Act.

(Amends 21 & 22 Vict. c. 90; Medical Act, 1858.
,, 36 Geo. 3, c. 9 (Irish Act); Surgeons to Hospitals, &c. (Ireland).)

41. An Act to remove Restrictions on the granting of Qualifications for Registration under the Medical Act on the ground of Sex.

(Extends powers of granting qualifications for registrations without distinction of sex; and incorporates Act with 21 & 22 Vict. c. 90, as amended by 22 Vict. c. 21.)

42. An Act to amend the Law respecting certain Returns from Convict Prisons.

(Repeals section 14 of 5 Geo. 4, c. 84; Transportation.)

43. An Act to make provision respecting the Superannuation Allowances or Pensions of Persons employed in the Service of Her Majesty in the Government of the Isle of Man.

(Applies Superannuation Act, 1859, and Colonial Governors Pensions Acts, 1865 and 1872.)

44. An Act to amend the Law relating to Legal Practitioners in Ireland.

(Amends 12 & 13 Vict. c. 53; Attorneys and Solicitors (Ireland).)

*45. An Act to consolidate and amend the Laws relating to Industrial and Provident Societies.

(Repeals 25 & 26 Vict. c. 87, 30 & 31 Vict. c. 117, and 34 & 35 Vict. c. 80; Industrial and Provident Societies.
Applies Companies Acts, 1862 and 1867; Building Societies Act, 1874; sections 6 to 9 of Friendly Societies Act, 1875; Summary Jurisdiction Acts, as to England and Ireland; Summary Procedure Act, 1864, as to Scotland; also as to Appeals in Scotland, 20 Geo. 2, c. 43, and 38 & 39 Vict. c. 62.)

46. An Act for more effectually punishing Offences against the Laws relating to the Slave Trade.

(Recites Government of India Acts, 28 & 29 Vict. c. 17, and 32 & 33 Vict. c. 98, and provides for punishment of certain offenders upon the High Seas or in certain parts of Asia or Africa.)

47. An Act to make provision for the Government of the Islands of Saint Vincent, Tobago, and Grenada, and their Dependencies.

(Validates certain Acts of the Colonial Legislatures of Saint Vincent, Tobago, and Grenada.)

*48. An Act to amend the Law with reference to Bankers' Books Evidence.

(Amends law as to production of Bankers' Books in legal proceedings.)

49. An Act to make provision for lighting Burghs in Scotland with Gas.

(Applies General Police and Improvement (Scotland) Act, 1862; Valuation of Lands (Scotland) Act, 1854; Lands Clauses (Scotland) Acts, 1845 and 1860; Commissioners Clauses Act, 1847; Gasworks Clauses Acts, 1847 and 1871; Summary Procedure Act, 1864.)

50. An Act to amend the Law for the Relief of the Poor in Ireland in respect to rating and chargeability on Poor Law Unions.

(Amends Poor Law Act, 1 & 2 Vict. c. 56, and Acts amending the same.
Repeals section 1 of 25 & 26 Vict. c. 83.)

51. An Act to amend the Acts relating to Cattle Disease in Ireland.

(Amends 29 & 30 Vict. c. 4, 33 & 34 Vict. c. 36, and 37 & 38 Vic. c. 6.
Repeals section 12 of 29 and 30 Vict. c. 4, as to compensation for animals slaughtered.)

52. An Act to amend the Law respecting the Powers and Duties vested in the Barrister appointed to certify the Rules of Savings Banks.

(Amends 26 & 27 Vict. c. 87; Savings Banks.
Applies Friendly Societies Act, 1875, and Public Offices Fees Act, 1866.)

53. An Act to make further provision respecting the Superannuation Allowance to be granted to Civil Servants serving in unhealthy Climates.

(Repeals Superannuation Act, 1875 (38 & 39 Vict. c. 4).
Applies Superannuation Act, 1859 (22 Vict. c. 26).)

*54. An Act to provide for the Foundation of a new Bishopric out of a part of the diocese of Exeter.

(Empowers Her Majesty, by Order in Council, to found new Bishopric of Truro.)

55. An Act for further amending the Acts relating to the raising of Money by the Metropolitan Board of Works; and for other purposes relating thereto.

(Amends 38 & 39 Vict. c. 65.
Applies Metropolis Management Acts, 1855 and 1862. and Fire Brigade Act, 1865.)

56. An Act for facilitating the regulation and improvement of Commons, and for amending the Acts relating to the Inclosure of Commons.

(Amends Inclosure Acts, 1845 to 1868; viz., 8 & 9 Vict. c. 118, 9 & 10 Vict. c. 70, 10 & 11 Vict. c. 111, 11 & 12 Vict. c. 99, 12 & 13 Vict. c. 83, 14 & 15 Vict. c. 53, 15 & 16 Vict. c. 79, 17 and 18 Vict. c. 97, 20 & 21 Vict. 3. 31, 22 & 23 Vict. c. 43, and 31 & 32 Vict. c. 89.
Repeals certain parts of 8 & 9 Vict. c. 118.
Applies Public Health Act, 1875, and Charitable Trusts Act, 1860.
Saves (except as otherwise provided) Metropolitan Commons Acts, 1866 and 1869.)

57. An Act to amend the Law respecting the holding of Winter Assizes.

(Applies existing Acts as to alteration of Circuits.
" 4 & 5 Will. 4, c. 36; Central Criminal Court.
" 3 & 4 Will. 4, c. 71; Assizes (England and Wales).)

58. An Act to amend the Law relating to Parochial Records.

(Removes doubts as to application of 38 & 39 Vict. c. 59 (Public Records, Ireland) to certain books kept under Marriages (Ireland) Act, 7 & 8 Vict. c. 81.
Construes Act with Public Records (Ireland) Acts, 1867 and 1875.)

*59. An Act for amending the Law in respect of the Appellate Jurisdiction of the House of Lords; and for other purposes.

(Amends 34 & 35 Vict. c. 91; Judicial Committee of Privy Council.
Repeals certain parts of Judicature Acts, 36 & 37 Vict. c. 66, and 38 & 39 Vict. c. 77, and section 16 of 3 & 4 Vict. c. 86, Church Discipline.
Removes doubts as to exercise of power by the Admiralty under the Vice-Admiralty Courts Act, 1863 (26 & 27 Vict. c. 24.)

60. An Act to apply a sum out of the Consolidated Fund to the service of the year ending the 31st of March, 1877, and to appropriate the Supplies granted in this Session of Parliament.

*61. An Act to provide for the better arrangement of divided Parishes and other local areas, and to make sundry amendments in the Law relating to the Relief of the Poor in England.

(Amends 4 & 5 Will. 4, c. 76, 7 & 8 Vict. c. 101, 12 & 13 Vict. c. 103, and 13 & 14 Vict. c. 101, Poor Law Amendment; 30 & 31 Vict. c. 6, Metropolitan Poor; 36 & 37 Vict. c. 9, Costs in Bastardy; 34 & 35 Vict. c. 108, Pauper Inmates Discharge, &c.; 20 Vict. c. 19, as to exemption of Inns of Court, &c.; 4 & 5 Vict. c. 48, as to exemption of corporate property.
Repeals section 1 of 56 Geo. 3, c. 139, as to parish apprentices.
Applies 11 & 12 Vict. c. 110; Poor Law Union Charges.)

62. An Act to make provision for the Disposal of certain Lands appropriated for the supply of materials for the repair of public and private roads.

(Applies Union and Parish Property Act, 1835.
" Parish Property and Parish Debts Act, 1842.)

63. An Act to render necessary in Ireland a Year's Notice to Quit to determine a Tenancy from Year to Year, and otherwise amend the Law as to Notices to Quit.

(Amends 33 & 34 Vict. c. 46, Landlord and Tenant (Ireland), and construes Act therewith.)

64. An Act to continue for one year the Police (Expenses) Act, 1875.

(Continues 38 & 39 Vict. c. 48, till 1st September, 1877.)

65. An Act to amend the Tramways (Ireland) Act, 1860, and the Tramways (Ireland) Amendment Act, 1861, as regards the application of the same to the County and the County of the City of Dublin.

(Amends 23 & 24 Vict. c. 152, and 24 & 25 Vict. c. 102, as regards their application to Dublin.)

66. An Act to amend the Law relating to Legal Practitioners.

(Authorises solicitors to appear as proctors in Provincial Courts of Canterbury and York.)

67. An Act for making provision respecting Shares in the Capital of the Universal Company of the Maritime Canal of Suez, acquired on behalf of the Crown.

(Recites Agreement with the Khedive of Egypt as to purchase of his Shares for the sum of 4,000,000*l*.)

68. An Act to amend the Law for the payment of Remuneration and the Grant of Superannuation Allowances and Gratuities to certain persons employed under Her Majesty's Principal Secretary of State for the War Department and Her Majesty's Postmaster-General.

(Amends 22 Vict. c. 26, and 36 & 37 Vict. c. 23; Superannuation.)

69. An Act to continue various expiring Laws.

(Continues (as in Schedule) the following Acts, and Acts amending the same, viz.:—

5 & 6 Will. 4, c. 27; Linen, &c., Manufactures (Ireland).
3 & 4 Vict. c. 89; Poor Rates (Stock in Trade Exemption).
4 & 5 Vict. c. 35; Copyhold, &c., Commissions.
4 & 5 Vict. c. 59; Application of Highway Rates.
10 & 11 Vict. c. 32; Landed Property Improvement (Ireland).
10 & 11 Vict. c. 98; Ecclesiastical Jurisdiction.
11 & 12 Vict. c. 32; County Cess (Ireland).
11 & 12 Vict. c. 107; Sheep and Cattle Diseases.
14 & 15 Vict. c. 104; Episcopal, &c., Estates.
17 & 18 Vict. c. 102; Corrupt Practices Prevention.
23 & 24 Vict. c. 19; Dwellings for Labouring Classes (Ireland).
24 & 25 Vict. c. 109; Salmon Fishery (England).
25 & 26 Vict. c. 97; Salmon Fisheries (Scotland).
26 & 27 Vict. c. 105; Promissory Notes.
27 & 28 Vict. c. 9; Malt for Animals.
27 & 28 Vict. c. 20; Promissory Notes, &c. (Ireland).
28 & 29 Vict. c. 46; Militia Ballots Suspension.
28 & 29 Vict. c. 66; Malt Duty.
28 & 29 Vict. c. 83; Locomotives on Roads.
29 & 30 Vict. c. 52; Prosecution Expenses.
31 & 32 Vict. c. 125; Election Petitions, &c.
32 & 33 Vict. c. 21; Election Commissioners' Expenses.
34 & 35 Vict. c. 87; Sunday Observance Prosecutions.
34 & 35 Vict. c. 105; Petroleum.)

70. An Act to alter and amend the Law relating to the Administration of Justice in Civil Causes in the ordinary Sheriff Courts in Scotland, and for other purposes relating thereto.

(Repeals section 15 of 16 & 17 Vict. c. 80; Sheriff Courts (Scotland).
Amends 6 & 7 Will. 4, c. 56; Cessio bonorum (Scotland).
,, and in part repeals, 21 & 22 Vict. c. 56; Confirmation of Executors (Scotland).
,, section 11 of 33 & 34 Vict. c. 86; Sheriffs (Scotland).
Abolishes Commissary Courts, and transfers powers to Sheriffs.)

71. An Act to amend the Law relating to the Jurisdiction of Chairmen of Quarter Sessions in Ireland.

(Amends 14 & 15 Vict. c. 57 (Civil Bills, Ireland), and Acts amending same.)

72. An Act to suspend for a limited period the holding of an Election of a Member or Members to serve in Parliament for the City of Norwich, and to disfranchise certain voters for the said City, and also certain voters for the Borough of Boston.

*73. An Act to amend the Pensions Commutation Act, 1871.
(Amends section 10 of 34 & 35 Vict. c. 36, as to certain half-pay officers.
As to application of 35 & 36 Vict. c. 83, to certain officers of telegraph companies.)

74. An Act for amending so much of the Agricultural Holdings (England) Act, 1875, as relates to the Governors of the Bounty of Queen Anne for the Augmentation of the Maintenance of the Poor Clergy.
(Amends section 49 of 38 & 39 Vict. c. 92, as far as it relates to the Governors of Queen Anne's Bounty.)

*75. An Act for making further provision for the Prevention of the Pollution of Rivers.
(Applies Public Health Act, 1875, Public Health (Scotland) Act, 1867, and Public Health (Ireland) Act, 1874.
,, Lee Conservancy Act, 1868.
Saves certain Conservancy Acts.)

76. An Act to extend the privileges of Municipal Corporations in Ireland.
(Assimilates privileges of municipal bodies in Ireland to those of England and Scotland.)

*77. An Act to amend the Law relating to Cruelty to Animals.
(Prohibits painful experiments on Animals.
Applies Summary Jurisdiction Act, 1848.
,, Summary Procedure Act, 1864.
,, Petty Sessions (Ireland) Act, 1851.)

78. An Act to amend the Procedure connected with Trial by Jury in Ireland.
(Amends 34 & 35 Vict. c. 65, and 35 & 36 Vict. c. 25; Juries (Ireland).
Abolishes Market Juries, and repeals provisions of Irish Acts relating thereto, viz.:—13 & 14 Geo. 3, c. 22, s. 73, and 15 & 16 Geo. 3, c. 20, s. 43; Dublin Paving, &c. 27 Geo. 3, c. 46 (wholly), Market Juries in cities. 28 Geo. 3, c. 42, s. 9, continuing certain statutes.)

*79. An Act to make further provision for Elementary Education.
Amends, and repeals in part, 33 & 34 Vict. c. 75; } Elementary Education Acts,
,, 36 & 37 Vict. c. 86; } 1870 and 1873.
Repeals sections 14 and 15 of 30 & 31 Vict. c. 146; Workshops Regulation.
,, 36 & 37 Vict. c. 67; Agricultural Children.
,, section 29 of 37 & 38 Vict. c. 88; Registration of Births, &c.
As to application of certain sections of the Factory Acts and the Workshops Regulation Acts.
As to application of the Industrial Schools Act, 29 & 30 Vict. c. 118.)

*80. An Act to amend the Merchant Shipping Acts.
(Repeals 31 & 39 Vict. c. 88; Merchant Shipping Act, 1875.
Amends (and in part repeals)—17 & 18 Vict. c. 104, 34 & 35 Vict. c. 110, 35 & 36 Vict. c. 73, and 36 & 37 Vict. c. 85; Merchant Shipping Acts, 1854—1873.
Amends 18 & 19 Vict. c. 119; Passengers Act, 1855.)

*81. An Act for amending the Law relating to Crossed Cheques.
(Repeals 19 & 20 Vict. c. 25, and 21 & 22 Vict. c. 79; Bankers' Drafts and Cheques.)

ABSTRACTS OF IMPORTANT ACTS

PASSED IN THE THIRD SESSION OF THE TWENTY-FIRST PARLIAMENT OF GREAT BRITAIN AND IRELAND.

1. CHURCH AND EDUCATION.

BISHOPRIC OF TRURO.

[39 and 40 Victoriæ, cap. 54.—11th August, 1876.]

An Act to provide for the Foundation of a new Bishopric out of a part of the Diocese of Exeter.

The preamble recites the expediency of providing increased episcopal supervision for the Archdeaconry of Cornwall in the diocese of Exeter, and states that with a view to this end it has been proposed to form a Bishopric of Truro consisting of the Archdeaconry of Cornwall, the Bishop of Exeter having also assented to the transfer of such a portion of the endowment of his bishopric as will yield a net annual sum of 800*l.* for the new see. Section 1 gives the short title as "The Bishopric of Truro Act, 1876." Section 2 empowers the Ecclesiastical Commissioners for England to receive public contributions to the endowment of the bishopric, and to carry such contributions to a fund to be called the Truro Bishopric Endowment Fund. Section 3 provides for the transfer to the Truro Bishopric of such a portion of the endowment or income of the Exeter Bishopric as will, irrespective of tenths and first fruits, yield a net annual sum of 800*l.* Section 4 provides that whenever the Ecclesiastical Commissioners certify to Her Majesty under their common seal either—(1.) That the net income of the Truro Bishopric Endowment Fund is not less than 3,000*l.* a year; or (2.) that the net income is not less than 2,500*l.* a year, and that contributions to that fund sufficient to raise the net income within five years from the date of the certificate up to 3,000*l.* a year have been guaranteed to the satisfaction of the Commissioners, Her Majesty by Order in Council may found a new Bishopric of Truro, with a diocese consisting of the Archdeaconry of Cornwall, or of such part thereof as to Her Majesty may seem meet, and may assign to such bishopric as a cathedral church the parish church of St. Mary, in Truro, in the county of Cornwall, but subject to the rights of the patron and incumbent of such church, and may declare the time at which such Order founding the bishopric is to come into operation. Her Majesty by the same or any other Order in Council may constitute the Bishop of Truro a body corporate, and may invest the bishop with all such rights, privileges, and jurisdictions as are now possessed by any other bishop in England, or such of them as to Her Majesty may seem meet, and may subject such bishop to the metropolitan jurisdiction of the Archbishop of Canterbury. By the same section it is enacted that the net income of the Truro Bishopric Endowment Fund, for the purposes of this section, shall be estimated exclusive of the value of any episcopal residence

which may have been provided, or any sum appropriated for the purpose of providing such episcopal residence, but inclusive of any sum which will be derived from the Bishopric of Exeter immediately upon the foundation of the Bishopric of Truro, and in such estimate no deduction shall be made from the last-mentioned sum on account of any payment for tenths or first fruits. By section 5 the number of Lords Spiritual sitting and voting as Lords of Parliament is not to be increased by the foundation of the Bishopric of Truro, the vacancies by the avoidance of the sees of Canterbury, York, London, Durham, or Winchester are to be filled up by the issue of a writ of summons to the bishop acceding to the see so avoided, and in the case of the avoidance of any other see a writ of summons is to be issued to the bishop, who, having been longest appointed a bishop of an English see, has not previously become entitled to such writ, provided that where a bishop is translated and was at the time of translation sitting as a Lord of Parliament, he shall not lose his right to receive a summons to Parliament. Section 6 provides for the appointment of the Bishop of Truro, so long as there is not a dean and chapter of Truro, by letters patent; but after the foundation of such dean and chapter vacancies in the see are to be filled as in the case of other English bishoprics. Section 7 requires the Ecclesiastical Commissioners, on the foundation of the see, to lay before Her Majesty a scheme for the creation of courts, officers, archdeaconries, and other kindred arrangements incidental to the new bishopric; for giving the Bishop of Truro the patronage of every ecclesiastical dignity and benefice situate in his diocese the patronage of which is, at the date of the scheme, vested in the Bishop of Exeter; for transferring the portion of the endowment or income of the Bishopric of Exeter already referred to; for enabling any existing archdeacon in the diocese of Exeter to reside in any place in which he is residing at the date of the scheme, and for precluding any officer holding office at the date of the passing of this Act from being prejudiced by this Act, or any Order in Council made thereunder; for founding honorary canonries in the cathedral church of Truro, with power to dispense with the consent of any dean and chapter so long as there is no such dean and chapter in existence at Truro; and to provide that any non-residentiary canons in the cathedral church of Exeter, who upon the foundation of the Bishopric of Truro may be holding benefices in the diocese of Truro, and consent to the transfer, shall be transferred to and become honorary canons in the cathedral church of Truro instead of Exeter; for the transfer to the registrar of Truro from the registrar of Exeter of all terriers, tithe apportionments, maps, plans, and other documents relating to the parishes in the diocese of Truro. Section 8 provides that the Truro Bishopric Endowment Fund shall be held by the Ecclesiastical Commissioners upon trust to provide a net annual income not exceeding 4,200*l.* a year and a residence for the Bishop of Truro, and subject as aforesaid upon trust for the foundation of a dean and chapter for the bishopric, in such manner as may be from time to time provided by Order in Council; and the section also entrusts the management and investment of the funds to the Ecclesiastical Commissioners, provided that there shall not be assigned as an endowment to the said bishopric, exclusive of an episcopal residence, a greater extent of land than will, after deducting the costs of management, produce as nearly as may be a net annual income of 4,200*l.*

ELEMENTARY EDUCATION.

[39 and 40 Victoriæ, cap. 79.—15th August, 1876.]

An Act to make further Provision for Elementary Education.

The preamble to the Act declares that it is expedient to make further provision for the education of children, and for securing the fulfilment of parental responsibility in relation thereto, and otherwise to amend and to extend the Elementary Education Acts. Section 1 gives the short title of the statute as "The Elementary Education Act, 1876." Section 2 exempts Scotland and Ireland from its operation, except as expressly provided; and section 3 fixes January 1st, 1877, for the commencement of the Act. The first division of the Act sets forth the "laws as to employment and education of children." Section 4 declares it to be the duty of the parent of every child to cause it to receive efficient elementary instruction in reading, writing, and arithmetic, and if the parent fails to perform this duty, he is to be liable to such orders and penalties as are provided by this Act. Section 5 renders it illegal to employ a child under ten, or a child over ten years of age who has not obtained a certificate either of his proficiency in reading, writing, and elementary arithmetic, or of previous due attendance at a certified efficient school, unless such child, being of the age of ten years or upwards, is employed, and is attending school in accordance with the provisions of the Factory Acts, or of any bye-law of the local authority made under section 74 of "The Elementary Education Act, 1870," as amended by "The Elementary Education Act, 1873," and this Act, and sanctioned by the Education Department. Persons employing a child in contravention of this Act are to be liable on summary conviction to a penalty not exceeding 40*s*. Section 7 provides for the enforcement of the law here laid down as to the employment of children, the authorities charged with the duty being—(1) In a school district within the jurisdiction of a School Board, by that board; and (2) in every other school district by a school attendance committee, appointed annually, if it is a borough, by the council of the borough, and, if it is a parish, by the guardians of the union comprising such parish. A school attendance committee under this section may consist of not less than six nor more than twelve members of the council or guardians appointing the committee, so, however, that, in the case of a committee appointed by guardians, one-third at least shall consist of *ex-officio* guardians, if there are any and sufficient *ex-officio* guardians. The school attendance committee is to make known in its district the provisions of the Act, except that it is the duty of the inspectors and sub-inspectors acting under the Acts regulating factories, workshops, and mines respectively, and not of the local authority, to enforce the observance by the employers of children in such factories, workshops, and mines of the provisions of this Act respecting the employment of children, the duty of the local authority being only to assist the said inspectors and sub-inspectors in the performance of their duty by information and otherwise. The local authority is to report to the Education Department any infraction of the provisions of section 7 of the Act, 1870, in any public elementary school within their district which may come to their knowledge, and also to forward to the Education Department any complaint which they may receive of the infraction of those provisions.

Section 8 refers to the employment and education of children in factories. Section 9 exempts employers from the penalties for employing children in cases where it is proved to the satisfaction of the court dealing with the case—(1) That during the employment there is not within two miles, measured according to the nearest road, from the residence of such child, any public elementary school open which the child can attend; or (2) that such employment, by reason of being during the school holidays, or during the hours during which the school is not open, or otherwise, does not interfere with the efficient elementary instruction of such child, and that the child obtains such instruction by regular attendance for full time at a certified efficient school, or in some other equally efficient manner; or (3) that the employment is exempted by the notice of the local authority hereinafter next mentioned (that is to say), the local authority may, if it thinks fit, issue a notice exempting from the prohibitions and restrictions of this Act the employment of children above the age of eight years for the necessary operations of husbandry and the ingathering of crops, for the period to be named in such notice: provided that the period or periods so named by any local authority shall not exceed in the whole six weeks between the 1st of January and 31st of December in any year. Section 10 empowers guardians to pay the school fee not exceeding 3*d.* a week, or a part of it for parents, who, not being paupers, are unable to pay the ordinary fee for their child at a public elementary school, and who apply to the guardians, and the parent by accepting this is not to be deprived of any franchise, right, or privilege, or be subject to any disability, or disqualification. The school at which the fee is paid may be selected by the parent. The 25th section of the Act of 1870 is repealed by this section. Section 11 makes provision for orders of court for the attendance at school of children habitually neglected by their parents, or habitually wandering and consorting with criminals or disorderly persons. The local authority is first to warn the parents and then to bring the case before a court of summary jurisdiction, which is to give an order for attendance; but any of the following reasons is to be a reasonable excuse for non-attendance:—(1) That there is not within two miles, measured according to the nearest road from the residence of the child, any public elementary school which it can attend; or (2) that the absence of the child from school has been caused by sickness, or any unavoidable cause. Section 12 sets forth the procedure when a parent fails to comply with the order of court: in the first case of non-compliance if the parent does not appear or fails to satisfy the court that he has used all reasonable efforts to enforce compliance with the order, the court may impose a penalty not exceeding with costs 5*s.*; but if the parent satisfies the court that he has used all reasonable efforts, the court may, without inflicting a penalty, order the child to be sent to a certified day industrial school, or if there be no such school suitable for the child it may be sent to an industrial school. Subsequent failures of compliance are to be dealt with by fine or by sending the child to an industrial school, provided that a complaint under this section with respect to a continuing non-compliance with any attendance order shall not be repeated by the local authority at any less interval than two weeks. A child shall be sent to a certified industrial school or certified day industrial school in pursuance of this section in like manner as if sent

in pursuance of the Industrial Schools Act, 1866, and when so sent shall be deemed to have been sent in pursuance of that Act and the Acts amending the same; and the parent, if liable under the said Acts to contribute to the maintenance and training of his child when sent to an industrial school, shall be liable so to contribute when his child is sent in pursuance of this section. Section 13 requires a local authority to take procedings under this Act when information is given by any person that there is a child under their jurisdiction who is liable to its provisions. Section 14 allows managers of industrial schools to give children sent under this Act a licence to live out of the school under section 27 of the "Industrial Schools Act, 1866," such licence being conditional on their continued attendance as day scholars. Section 15 refers to the provision of industrial schools by School Boards. Section 16 relates to day industrial schools. If a Secretary of State is satisfied that, owing to the circumstances of any class of population in any school district, a school in which industrial training, elementary education, and one or more meals a day, but not lodging, are provided for the children, is necessary or expedient for the proper training and control of the children of such class, he may, in like manner as under the "Industrial Schools Act, 1866," certify any such school (in this Act referred to as a day industrial school) in the neighbourhood of the said population to be a certified day industrial school. Any child authorised by the "Industrial Schools Act, 1866," to be sent to a certified industrial school, may, if the court before whom the child is brought think it expedient, be sent to a certified day industrial school; any child sent to a certified day industrial school by an order of a court (other than an attendance order under this Act) may during the period specified in the order be there detained during such hours as may be authorised by the rules of the school approved by the said Secretary of State. A certified day industrial school shall be deemed to be a certified efficient school within the meaning of this Act. The remainder of this section is devoted to the regulations as to the attendance and maintenance of children ordered by a court of summary jurisdiction to be sent to certified industrial schools. One important provision is that the managers of such schools may, upon the request of a local authority and of the parent of a child, and upon the undertaking of the parent to pay towards the industrial training, elementary education and meals of such child, such sum of not less than 1*s.* a week (to be fixed from time to time by a Secretary of State) receive such child into the school under an attendance order, or without an order of a court, and there may be contributed out of moneys provided by Parliament in respect of that child such sum not exceeding 6*d.* a week, and on such conditions as a Secretary of State, from time to time recommends. Section 17 gives the conditions of Parliamentary contributions to day industrial schools, the most important being that the children are to be examined, according to the standard of proficiency for the time being in force for the purposes of a Parliamentary grant to public elementary schools. Sections 18 to 20 relate to "the Parliamentary grant." By section 17, where a child during the first five years of the operation of the Act, or for any longer period fixed by Order in Council, obtains, before he reaches the age of eleven years, a certificate of proficiency in reading, writing, and arithmetic, and a certificate of previous due attendance at an elementary school, then the school fees of such

child at any public elementary school for the next three years after he obtains such certificate may be paid by the education department, the fees so paid being reckoned as school pence, to be met by the grant payable by the department. Section 19 commences with the important provision that so much of section 97 of the Elementary Education Act, 1870, as enacts that the conditions required to be fulfilled by an elementary school, in order to obtain the annual Parliamentary grant, shall provide that the grant shall not for any year exceed the income of the school for that year which was derived from voluntary contributions and from school fees, and from any sources other than the Parliamentary grant, shall be repealed as from the 31st day of March, 1877. After the 31st day of March, 1877, the conditions required to be fulfilled by an elementary school in order to obtain the annual Parliamentary grant shall provide that —(1) Such grant shall not in any year be reduced by reason of its excess above the income of the school if the grant do not exceed the amount of 17*s.* 6*d.* per child in average attendance at the school during that year, but shall not exceed that amount per child, except by the same sum by which the income of the school, derived from voluntary contributions, rates, school fees, endowments, and any source whatever other than the Parliamentary grant, exceeds the said amount per child; and (2) Where the population of the school district in which the school is situate, or the population within two miles, measured according to the nearest road from the school, is less than three hundred, and there is no other public elementary school recognised by the Education Department as available for the children of that district, or that population (as the case may be), a special Parliamentary grant may be made annually to that school to the amount, if the said population exceeds 200, of 10*l.*, and, if it does not exceed 200, of 15*l.*; and (3) The said special grant shall be in addition to the ordinary annual Parliamentary grant, and shall not be included in the calculation of that grant for the purpose of determining whether it does or does not exceed the amount before in this section mentioned. By section 20 the conditions required to be fulfilled by schools in order to obtain annual Parliamentary grants are to provide that the income of the schools shall be applied only for the purpose of public elementary schools. By section 21 a school attendance committee is given the same powers as a school board for enforcing bye-laws for the attendance of children at school. Section 22 contains provisions as to the requisition of a parish to a school attendance committee. Sections 24 to 36 contain administrative provisions for carrying out the Act, as to certificates of proficiency and previous attendance at school (section 24); certificates of birth for children where required under the Act (section 25); returns of registrars of births and deaths to school boards (section 26); as to steps to be taken by the Education Department when local authorities fail to perform their duty under the Act (section 27); the power of local authorities to appoint officers to carry out the Act (section 28); the power of the officers of local authorities with authority of a justice of the peace, to enter places where it is believed children are employed in contravention of the Act (section 29); the payment of expenses of school attendance committees (section 31); the power of a school attendance committee to appoint local committees (section 32); the power of an urban sanitary authority to appoint a

school attendance committee (section 33); the expenses incurred under the Act (section 34). Section 37 supplies rules for legal proceedings under the Act. By section 38 no prosecutions are to be undertaken except with the authority of two members of a school board or local authority. The miscellaneous provisions include an adaptation of 36 and 37 Vict., cap. 86, section 3, respecting pauper children, to this Act, and section 41 provides for the dissolution of school boards under certain circumstances, viz., where application is made to the Education Department by the like persons and in the like manner as an application for the formation of a school board under section 12 of the Act of 1870, nevertheless, by a majority of not less than two thirds of those voting on the occasion. On such application if the Education Department are satisfied that no school and no site for a school is in the possession of or under the control of the School Board, and that there is a sufficient amount of public school accommodation for the school board district and if no requisition has been sent by the Department to such board requiring them, to supply school accommodation, then it is the duty of the Department to take the case into consideration, and if they are of opinion that the maintenance of a board is not required for the purposes of education in the district, they may order the dissolution of the board, provided always that no application for the dissolution of a board is to be made except within six months before the expiration of the period for which it was elected, and no order for dissolution is to take effect until after the expiration of such period. The Department is also given power by this section to make provision for the disposal of the property of dissolved boards. The Department is in each case to lay before Parliament its reasons for consenting to the dissolution of a board. By section 42, where a school board satisfy the Education Department that having regard to the large population of the district of such board, it is necessary or proper that the board should provide an office, the Education Department may authorise the board to provide an office, and the board shall for that purpose have the same power as they have under the Elementary Education Acts, 1870 to 1873, for the purpose of providing sufficient school accommodation for their district, including the power of borrowing money under section 10 of the Elementary Education Act, 1873, and the provision of such office shall be deemed to be a work for which a school board is authorised to borrow within the meaning of the Public Works Loans Act, 1875. By section 43 a local authority is to send to the Education Department the same returns that are required from a School Board under the Act of 1870. Section 48 declares that a child in this Act means a child between the ages of five and fourteen. There are other miscellaneous provisions and four schedules.

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2. FINANCE AND TAXATION.

BANKERS' BOOKS EVIDENCE.

[39 and 40 Victoriæ, cap. 48.—11th August, 1876.]

An Act to amend the Law with reference to Bankers' Books Evidence.

The preamble recites that as serious inconvenience has been occasioned both to the bankers and to the public by the removal from the

banks of ledgers and other account books for production in legal proceedings, it is expedient to facilitate the proof of transactions recorded in such ledgers and books. By section 1, the short title of the statute is to be "The Bankers' Books Evidence Act, 1876." Section 2 defines terms: a "bank," within the terms of the Act, as being a bank which has made a return to the Inland Revenue, and any Savings Bank certified under the Act of 1863; "legal proceedings" are to include all whether preliminary or final, criminal, civil, legal, or equitable, or otherwise in which there is power to administer an oath. Section 3 provides for the admission of entries in bank books as *primâ facie* evidence of the transactions therein recorded on affidavit of one of the partners, managers, or officers of the bank, that the books referred to are the ordinary books used in the bank, and that the entries were made in the usual course of business. Section 4 enacts that copies of all entries in any ledgers, day books, cash books, or other account books used by any such bank, may be proved in all legal proceedings as evidence of such entries without production of the originals, by means of the affidavit of a person who has examined the same, stating the fact of said examination, and that the copies sought to be put in evidence are correct. By section 5 it is provided, that in every case where it is intended to produce such copies, five days' notice in writing, or such other notice as may be ordered by the court, is to be given by the parties proposing to adduce the same to the other party or parties to the legal proceeding, and such other party or parties is or are at liberty to inspect the original entries and accounts. Section 6 empowers a judge of one of the superior courts to give orders for such party to inspect and take copies of any entry or entries in bank books relating to the matters in question in the legal proceedings, and such orders may be made by such judge at his discretion either with or without summoning before him such bank or the other party or parties to such legal proceedings, and shall be intimated to such bank at least three days before such copies are required. By section 7, on the application of any party to any legal proceedings who has received notice, a judge of one of the superior courts may order that such entries and copies mentioned in the said notice shall not be admissible as evidence of the matters, transactions, and accounts recorded in the bank books. By section 8, no bank is to be compellable to produce its books in any legal proceedings, unless a judge of one of the superior courts specially orders that such books should be produced.

PENSIONS COMMUTATION.

[39 and 40 Victoriæ, cap. 73.]

An Act to amend the Pensions Commutation Act, 1871.

The object of this statute is to amend the "Pensions Commutation Act, 1871." By that statute it was declared that if any pensionholder whose pension was commuted accepted any public employment, such deduction on account of this commuted pension as therein mentioned should be made from the salary or pension payable in respect of such employment. It is now stated to be expedient to exempt from the provision an officer in the army on half-pay who retires in the manner mentioned. The Act provides that in the case of half-pay

officers who before or after this Act have been permitted to retire and receive the regulation price of the saleable commission, and who accept any public employment, no deduction on account of the half-pay commuted shall be made under section 10 of the "Pensions Commutation Act, 1871," from the salary payable, or any pension granted in respect of such employment. An officer or clerk of any telegraph company (the undertaking of which has been purchased by the Postmaster-General) who is entitled to receive an amount during his life for loss of office is not to be entitled to commute the same unless application is made to the Postmaster-General before the 1st of January, 1877.

CROSSED CHECKS.

[39 and 40 Victoriæ, cap. 81.—15th August, 1876.]

This Statute consists of 12 sections, and repeals two former Acts on the subject—the 19th and 20th Vict., c. 25, and 21st and 22nd, c. 79. By section 3, check means a draught or order on a banker, payable to bearer or to order on demand, and includes a warrant for payment of dividend on stock. By section 4 there are general and special crossings. Where a check bears across its face an addition of the words "and Company," or any abbreviation thereof, between two parallel transverse lines, or of two parallel transverse lines simply, and either with or without the words "not negotiable," that addition is to be deemed a crossing, and the check deemed to be crossed generally. Where a check bears across its face an addition of the name of a banker, either with or without the words "not negotiable," the check is to be deemed to be crossed specially and to be crossed to that banker. Where a check is uncrossed, a lawful holder may, by section 5, cross it generally or specially; where a check is crossed generally, a lawful holder may cross it specially; where a check is crossed generally or specially, a lawful holder may add the words "not negotiable;" where a check is crossed specially, the banker to whom it is crossed may again cross it specially to another banker, his agent for collection. A crossing authorised by this Act is, by section 6, to be deemed a material part of the check, and it shall not be lawful for any person to obliterate or, except as authorised by this Act, to add to or alter the crossing. By section 7, where a check is crossed generally, the banker on whom it is drawn may not pay it otherwise than to a banker; where a check is crossed specially, the banker on whom it is drawn may not pay it otherwise than to the banker on whom it is crossed, or to his agent for collection. Where a check is crossed specially to more than one banker, except when crossed to an agent for the purpose of collection, the banker on whom it is drawn is, under section 8, to refuse payment thereof. Where the banker on whom a crossed check is drawn has in good faith and without negligence paid such check, if crossed generally to a banker and if crossed specially to the banker to whom it is crossed, or his agent for collection, being a banker, the banker paying the check and (in case such check has come to the hands of the payee) the drawer thereof are, by section 9, to be respectively entitled to the same rights and be placed in the same position in all respects as they would respectively have been entitled to and have been placed in if the amount of the check had been paid to and received by the true owner thereof. Any banker

paying a check crossed generally otherwise than to a banker, or a check crossed specially otherwise than to the banker to whom the same shall be crossed, or his agent for collection, is, by section 10, to be liable to the true owner for any loss owing to the check having been so paid. Where a check is presented for payment which does not at the time of presentation appear to be crossed, or to have had a crossing which has been obliterated, or to have been added to or altered otherwise than as authorised by this Act, a banker paying the check in good faith and without negligence is not, by section 11, to be responsible or incur any liability, nor shall the payment be questioned. Under section 12 a person taking a check crossed generally or specially, bearing in either case the words "not negotiable," is not to have (and is not to be capable of giving) a better title to the check than that which the person from whom he took it had. But a banker who has in good faith and without negligence received payment for a customer of a check crossed generally or specially to himself is not, in case the title to the check proves defective, to incur any liability to the true owner of the check by reason only of having received such payment. The Act has immediate operation.

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3. LAW AND JUSTICE.

ROYAL STYLE AND TITLES.

[39 and 40 Victoriæ, cap. 10.—27th April, 1876.]

An Act to enable Her Most Gracious Majesty to make an addition to the Royal Style and Titles appertaining to the Imperial Crown of the United Kingdom and its Dependencies.

The following is the full text of this short Statute.

Whereas, by the Act of the Union of Great Britian and Ireland, passed in the 40th year of the reign of His late Majesty King George III, cap. 67, it was provided that, after such Union as aforesaid, the Royal Style and Titles appertaining to the Imperial Crown of the United Kingdom and its Dependencies should be such as His Majesty, by His Royal Proclamation under the Great Seal of the United Kingdom, should be pleased to appoint: and whereas, by virtue of the said Act and of a Royal Proclamation under the Great Seal, dated the 1st day of January, 1801, the present style and titles of Her Majesty are "Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith:" and whereas, by the Act for the better government of India, passed in the session of the 21st and 22nd years of the reign of Her present Majesty, cap. 106, it was enacted that the government of India, theretofore vested in the East India Company in trust for Her Majesty, should become vested in Her Majesty, and that India should thenceforth be governed by and in the name of Her Majesty, and it is expedient that there should be a recognition of the transfer of government so made by means of an addition to be made to the style and titles of Her Majesty: Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—It shall be lawful for Her

Most Gracious Majesty, with a view to such recognition as aforesaid of the transfer of the Government of India, by Her Royal Proclamation under the Great Seal of the United Kingdom, to make such addition to the style and titles at present appertaining to the Imperial Crown of the United Kingdom and its Dependencies as to Her Majesty may seem meet.

APPELLATE JURISDICTION.

[39 and 40 Victoriæ, cap. 59.—11th August, 1876.]

An Act for amending the Law in respect of the Appellate Jurisdiction of the House of Lords; and for other purposes.

By section 1 the statute is to be cited as "The Appellate Jurisdiction Act, 1876." By section 2 it was to take effect on the 1st of November, 1876, with the exception of a few clauses which, out of 25, had immediate operation. By section 3 the cases in which appeal will lie to the House of Lords are from any order or judgment of Her Majesty's Court of Appeal in England; of any Court in Scotland from which error or an appeal at or immediately before the commencement of the Act (1st of November), lay to the House of Lords by Common Law or statute; and of any Court in Ireland in the same manner. Section 4 enacts that every appeal is to be brought by way of petition to the House of Lords. Under section 5 an appeal is not to be heard unless three Lords of Appeal are present,—namely, the Lord Chancellor of Great Britain, the Lords of Appeal in Ordinary to be appointed under this Act, and such Peers of Parliament as are for the time being holding or have held any of the offices in this statute described as "high judicial offices." For the purpose of aiding the House of Lords in the hearing and determination of appeals, Her Majesty may, under section 6, at any time after the passing of the Act (11th August), by letters patent appoint two qualified persons to be Lords of Appeal in Ordinary, but such appointment is not to take effect until the commencement of the Act. The qualification for such appointment is that the person has been at or before the time of his appointment the holder for a period of not less than two years of some one or more of the offices described in the Act as high judicial offices, or has been, at or before such time, for not less than fifteen years, a practising barrister in England or Ireland or a practising advocate in Scotland. Every Lord of Appeal in Ordinary is to hold his office during good behaviour, and to continue to hold the same notwithstanding the demise of the Crown; but he may be removed on the address of both Houses of Parliament; the salary to be 6,000*l.* a year. Every Lord of Appeal in Ordinary, unless otherwise entitled to sit in the House of Lords, is by virtue and according to the date of his appointment, to be entitled during his life to rank as a Baron by such style as Her Majesty may be pleased to appoint, and during the time he continues in his office as a Lord of Appeal in Ordinary, and no longer, to be entitled to a writ of summons to attend and vote in the House of Lords; but his dignity as a Lord of Parliament is not to descend to his heirs. On a vacancy by death, resignation, or otherwise the Lordship of Appeal may be filled up. A Lord of Appeal in Ordinary, if a Privy Councillor, is to be a member of the Judicial Committee of the Private Council, and, subject to the due performance by

a Lord of Appeal in Ordinary of his duties as to the hearing and determining of appeals in the House of Lords, it is to be his duty, being a Privy Councillor, to sit and act as a member of the Judicial Committee of the Privy Council. By section 7 the pension of a Lord of Appeal in Ordinary who has served for fifteen years, or is disabled by permanent infirmity, is to be equal in amount to the pension of the Master of the Rolls, in pursuance of the Supreme Court of Judicature Act, 1873, and previous service in a high judicial office may count towards pension. To prevent delay in the administration of justice, appeals may, under section 8, be heard during the prorogation of Parliament, and under section 9, during a dissolution of Parliament, if Her Majesty, by her sign manual, authorises the Lords of Appeal, in the name of the House of Lords, to sit and hear such appeals. Under section 10, an appeal is not to be entertained by the House of Lords without the consent of the Attorney-General or other law officer of the Crown in any case where proceedings in error or on appeal could not hitherto have been had in the House of Lords without the fiat of such officers. Section 11 enacts that after the commencement of the Act error shall not lie to the House of Lords, and an appeal shall not lie from any of the Courts from which an appeal to the House of Lords is given by this Act except in manner provided by the Act, and subject to such conditions as to the value in dispute and security for the costs, &c., as may be imposed by orders of the House of Lords. By section 12, except as may be allowed by orders of the House of Lords, an appeal is not to lie from any Court in Scotland or Ireland which according to the law or practice hitherto in use could not have been reviewed by that House either in error or appeal, but by section 13 the Act is not to affect pending business, which is to be conducted as if the statute had not passed. From section 14 to 24, amendments to existing Acts are set forth. The statute 34 and 35 Vict., c. 91, as to the paid Judges of the Judicial Committee of the Privy Council, is first referred to. When any two of the paid Judges of the Judicial Committee die or resign, Her Majesty may appoint a third Lord of Appeal in Ordinary, and on the death or resignation of the other two a fourth Lord of Appeal (in addition to the two Lords of Appeal already appointed under this Act), and may fill up vacancies in such third and fourth Lord of Appeal in Ordinary. Such Lords of Appeal are to hold office on precisely the same terms as if appointed under section 6 of this Act. Rules may be made by Her Majesty, with the advice of the Judicial Committee of the Privy Council, or any five of them, the Lord Chancellor being one, and of the Archbishops and Bishops being members of the Council, or any two of them, for the attendance of Archbishops and bishops as assessors in ecclesiastical cases before the Committee; and they may be appointed for one or more years, such rules to be laid before Parliament. By section 15, the 4th section of the Supreme Court of Judicature Act, 1875, is amended, which limited the number of ordinary Judges of the Court of Appeal to three at any one time, and it is enacted that in addition to the ordinary Judges of the Court of Appeal, Her Majesty may appoint three additional ordinary Judges of that Court; the first three appointments under this Act to be made by the transfer to the Court of Appeal of three Judges of the High Court of Justice, and the vacancies so created in the High Court of Justice shall not be

filled up except in the event and to the extent mentioned. Her Majesty, by her sign-manual, either before or after the commencement of this Act, but not to take effect until the commencement, may transfer to the Court of Appeal from the Divisions of the Queen's Bench, Common Pleas, or Exchequer such of the Judges, not exceeding three in number, each of whom has been a Judge for not less than two years, and shall not be an *ex officio* Judge of the Court of Appeal, and every Judge so transferred shall be deemed an additional ordinary Judge of the Court of Appeal, as if he had been appointed such Judge by letters patent. No Judge is to be so transferred without his own consent. Every additional ordinary Judge of the Court of Appeal is to be under an obligation to go Circuits, as if he were a Judge of the High Court of Justice. The expenses of Circuit are to be paid, and the officers attached to the Judge are to be continued with the same salaries and pensions. Under section 16 orders may be made for holding Divisional Courts of the Court of Appeal, and to regulate the sittings. By section 17, on and after the 1st December, 1876, actions may be heard by a single Judge, and a Divisional Court, held by two Judges, subject to rules to be made. In the event of the state of business in the High Court requiring an additional Judge, when any two of the paid Judges of the Judicial Committee have died or resigned, Her Majesty, upon the address of both Houses of Parliament, may appoint an additional Judge. There are, in sections 19 to 21 other provisions to carry out the Act, and (section 22), for appointments of deputies by district registrars, and (section 23) the appointment of officers of Vice-Admiralty Courts, with an enactment (section 24) as to the repeal of certain sections of the Church Discipline Act, and of the Supreme Court of Judicature Acts. High judicial offices are, by section 25 to mean—the Lord Chancellor of Great Britain or Ireland, paid Judges of the Judicial Committee, and Judges of Her Majesty's Superior Courts of Great Britain and Ireland; which Superior Courts include as to England, Her Majesty's High Court of Justice, and Her Majesty's Court of Appeal, and the Superior Courts of Law and Equity as they existed before the constitution of Her Majesty's High Court of Justice; as to Ireland, the Superior Courts of Law and Equity at Dublin; and as to Scotland, the Court of Session. The term "error," includes a writ of error or any proceedings in or by way of error.

REGISTRY AND PHOTOGRAPHING OF CRIMINALS.

[39 and 40 Victoriæ, cap. 23.—13th July, 1876.]

An Act to amend the Prevention of Crimes Act, 1871.

The preamble recites that unnecessary expense is incurred by the requirement of the "Prevention of Crimes Act, 1871," that all persons convicted of crime in the United Kingdom should be registered and photographed; and section 2 enacts that in Great Britain the Secretary of State, and in Ireland the Lord Lieutenant, may from time to time by order prescribe the class or classes of prisoners to which the enactments of the Act of 1871 are for the time being to apply; and such enactments, so long as any such orders are in force, are to be deemed to apply to the prescribed class or classes of prisoners only, and not to all persons convicted of crime.

4. TRADE AND MANUFACTURE.

MERCHANT SHIPPING.

[39 & 40 Victoriæ, cap. 80.—15th August, 1876.]

An Act to Amend the Merchant Shipping Acts.

The statute contains 45 sections and a schedule showing the enactments repealed from the 1st of October, 1876, on which day it came into operation (section 3). The first part of the new Act has reference to "unseaworthy ships." By section 4 every person who sends, or attempts to send, or is party to sending or attempting to send, a British ship to sea in such unseaworthy state that the life of any person is likely to be thereby endangered, is guilty of a misdemeanour, unless he proves that he used all reasonable means to ensure her being sent to sea in a seaworthy state, or that her going to sea in such unseaworthy state was, under the circumstances, reasonable and justifiable; and for the purpose of giving such proof he may give evidence in the same manner as any other witness. Every master of a British ship who knowingly takes the same to sea in such unseaworthy state that the life of any person is likely to be thereby endangered is guilty of a misdemeanour, unless he proves the allegations already stated, and he may give evidence. No prosecution is to be instituted, except by or with the consent of the Board of Trade or of the Governor of the British Possessions in which such prosecution takes place. A misdemeanour is not to be punishable upon summary conviction. Section 5 makes it obligatory on the shipowner to use all reasonable means to insure the seaworthiness of ships, and, by section 6, where a British ship is in any port of the United Kingdom in a defective condition, she may be detained, and the mode of procedure is pointed out. A Court of Survey for a port or district is, under section 7, to consist of a judge, sitting with two assessors, who are to be persons of nautical, engineering, or other special skill and experience, for appeals; and the power and procedure of the Court of Survey is set forth in section 8. By section 9 the Lord Chancellor may from time to time make, revoke, alter, and add to general rules for carrying into effect the provisions of the Act with reference to a Court of Survey. By section 10 the Board of Trade is liable for costs and damages if there be not reasonable and probable cause for the detention of the ship, and, by section 11, where a complaint is made to the Board of Trade or a detaining officer that a ship is unsafe, security for costs may be required. With respect to foreign ships overloading it is provided, by section 13, that where a foreign ship has taken on board all or any part of her cargo at a port in the United Kingdom, and is while at that port unsafe by reason of overloading or improper loading, the provision of this Act with respect to the detention of ships shall apply to her as if she were a British ship with certain modifications detailed. Section 14 details the procedure to be adopted by shipowners who are aggrieved at the refusal of certain certificates to their ships. Section 15 empowers the Board of Trade in cases of appeal under this Act involving scientific questions to refer the matter to one or more referees, approved by a Secretary of State, such referees having the same power as a judge of the Court of Survey. Sections 16 and 21 relate to passenger and emigrant ships. By section 16 any

steam-ship may carry passengers not exceeding twelve, although she has not been surveyed by the Board of Trade as a passenger steamer, and does not carry a Board of Trade certificate, as provided by the Merchant Shipping Act, 1854, with respect to passenger steamers. Section 17 empowers Her Majesty by Order in Council to give the same force to certificates granted after survey by the legislation of a British Possession as if they were given under this Act, provided the Board of Trade is satisfied with the certificates. Section 18 makes it unnecessary for steamers with certificates under the Merchant Shipping Act of 1854, which are still in force, to be again surveyed. Section 19 renders it needless for foreign passenger or emigrant ships with certificates attested by a British Consul to be re-surveyed. The Board of Trade is by section 20 empowered to modify the Passenger Acts as to food and accommodation in emigrant ships and all sea-going passenger steamers. By section 21 every emigrant ship must be provided with signals of distress, &c. As to the stowage of cargoes there are enactments in sections 22 and 23: the grain cargo to be in bags, and the deck cargo to be limited to space. After the 1st of November, 1876, a penalty is to be imposed, under section 24, for carrying deck-loads of timber in winter. Sections 25 to 28 relate to deck and load-lines. By section 25 every British ship (except ships under 80 tons register employed solely in the coasting trade, ships employed solely in fishing, and pleasure yachts) is to be permanently and conspicuously marked with lines of not less than 12 inches in length and 1 inch in breadth, painted longitudinally on each side amidships, or as near thereto as is practicable, and indicating the position of each deck which is above water. The upper edge of each of these lines is to be level with the upper side of the deck plank next the waterway at the place of marking. The lines are to be white or yellow on a dark ground, or black on a light ground. By section 26 every British ship, with the above-mentioned exceptions, is to have a mark upon each of her sides amidships, or as near thereto as is practicable, in white or yellow on a dark ground, on in black on a light ground, a circular disc 12 inches in diameter, with a horizontal line 18 inches in length drawn through its centre. The centre of this disc is to indicate the maximum load-line in salt water to which the owner intends to load the ship for that voyage. Section 27 relates to the load-line on coasting vessels. By section 28 any master or owner neglecting to mark his ship, or allowing her to be so loaded as to submerge the centre of the disc, except in the event of the particulars thereby denoted being lawfully altered, or except for the purpose of escaping capture by an enemy, shall for each offence incur a penalty not exceeding 100*l*. If any of the marks required by this Act is in any respect inaccurate, so as to be likely to mislead, the owner of the ship is to incur a penalty not exceeding 100*l*. Sections 29 to 33 relate to shipping casualties. By section 29 the Lord Chancellor may appoint Wreck Commissioners for investigating "shipping casualties," and make rules as to fees, &c. Their duties are pointed out. Among the miscellaneous enactments, section 36 requires the name and address of the managing owner of every British ship registered at any port or place in the United Kingdom, to be registered at the Custom-House of the ship's port of registry. Under section 37 Her Majesty may, by Order in Council, apply certain provisions in the Merchant Shipping Acts to foreign ships. On and after the 1st of January, 1877, all fees payable in respect of the

survey or measurement of ships under the Merchant Shipping Acts, 1854 to 1876, or in respect of any services performed by any person under the Passengers Act, 1855, are, under section 39, to be paid to the superintendent of a mercantile marine office to be carried to the Exchequer, and form part of the Consolidated Fund. Out of money provided by Parliament the Wreck Commissioners, Courts of Survey, and other officers are to be paid. The act is to be applied to Scotland, Ireland, and Isle of Man.

INDUSTRIAL AND PROVIDENT SOCIETIES.

[39 and 40 Victoriæ, cap. 45.—11th August, 1876.]

An Act to consolidate and amend the Laws relating to Industrial and Provident Societies.

The preamble declares the expediency of consolidating and amending the laws relating to Industrial and Provident Societies, and of assimilating them, in some respects, to the law relating to Friendly Societies. Section 1 gives the short title of the Act as "The Industrial and Provident Societies Act, 1876," and section 2 gives it operation throughout Great Britain and Ireland and the Channel Islands. Section 3 defines the terms used in the Act. By section 5, every existing incorporated society, whose rules have been registered or certified under any Act relating to Industrial and Provident Societies, is deemed a society under this Act. By section 6, the societies which may be registered under this Act are societies (herein called industrial and provident societies) for carrying on any labour, trade, or handicraft, whether wholesale or retail, including the buying and selling of land, but as to the business of banking subject to the provisions hereinafter contained, of which societies no member other than a society registered under this Act shall have or claim an interest in the funds exceeding 200*l.* sterling. Section 7 contains provisions as to registration. No society can be registered which does not consist of seven persons at least, and the application for registration, signed by seven members and the secretary, must be sent, with two copies of the rules, to the Registrar of Friendly Societies. Identity, or a deceptive similarity in the names of societies, is not to be allowed, and no change of name is to be permitted without the registrar's sanction. Societies registered under the Acts of 1852, 1862, and 1867 may obtain an acknowledgment of registration under this Act. The word "limited" is to be the last word in the name of every society registered. Societies carrying on business in more than one country of the United Kingdom are to be registered in the country in which their registered office is situated, but copies of the rules of such societies, and of all amendments of the same, are, when registered, to be sent to the registrar of each of the other countries, to be recorded by him; and until such rules are so recorded the society is not to be entitled to any of the privileges of this Act in the country in which such rules have not been recorded, and until such amendments of rules are recorded they are not to take effect in such country. There are further provisions for the acknowledgment of registration by the registrar, and for appeals from the refusal of the registrar to register. If the refusal of registry is overruled on appeal, an acknowledgment of registry is thereupon to be given to the society by the registrar.

The acknowledgment of registry is to be conclusive evidence that the society therein mentioned is duly registered, unless it is proved that the registry of the society has been suspended or cancelled. Section 8 provides for the cancelling or suspension of registry when the chief registrar, or, in the case of societies in Scotland or Ireland exclusively, the assistant registrar, may cancel the registry, by writing under his hand, if he thinks fit, at the request of a society, or with the approval of the Treasury, on proof that an acknowledgment of registry has been obtained by fraud or mistake, or that a society exists for an illegal purpose, or has wilfully violated the Act. The chief or assistant registrar, in any case in which he might, with the Treasury's approval, cancel the registry of a society, may suspend it for a period not exceeding three months, which may be renewed, with Treasury sanction. Two months' notice of cancelling or suspension, specifying the cause, is to be given by the registrar to the society, and notice published in the "Gazette" or other newspaper circulating in the place, as soon as possible after it takes place. Societies may appeal against cancelling or suspension, as they may against refusal to register. Section 9 contains various provisions as to rules and amendments of rules and registration. Section 10 recites the duties and obligations of every society to have a registered office, to publish its name outside the office and elsewhere, to submit its accounts to an annual public audit, to send annual returns to the registrar, to permit members to inspect the books at reasonable times, to supply copies of annual returns gratuitously to every member or interested person, and to keep a copy of the last balance-sheet and auditor's report hung up in a conspicuous place in the registered office. There are also provisions as to banking, and as to offences against the Act. Section 11 recites the privileges of registered societies. The registration of a society is to render it a body corporate by the name described in the acknowledgment of registry by which it may sue and be sued, with perpetual succession and a common seal, and with limited liability; the rules are to bind all the members; moneys due from members to be a debt recoverable from them; the society is not to be chargeable under Schedule (C) or Schedule (D) of the Income Tax Acts, but no member of or person employed by the same to whom any profits are paid is to be exempted from any assessment to the said duties to which he would otherwise be liable. Members not under 16 years of age may nominate any person, except an officer or servant (and one of these if he is husband, wife, father, mother, child, brother, sister, nephew, or niece of the nominator) to whom his shares in the society shall be transferred at his decease, provided that the amount credited to him in the books of the society does not exceed 50*l.*, and may from time to time revoke or vary such nomination by a writing under his hand similarly delivered or sent, but not otherwise, and every such society shall keep a book wherein the names of all persons thus nominated are entered. Persons under 16 may become members if the rules do not forbid. Promissory notes or bills of exchange, accepted or endorsed in the society's name by an authorised person, are to be deemed to have been made, accepted, or endorsed on behalf of the society. A register of members is to be kept. Details are also given as to how contracts on behalf of the society may be made, varied, or discharged. Section 12 relates to the holding of the property of societies, advances to members, in-

vestments, application of profits, &c. Section 13 provides for the giving of security by officers and for their rendering of accounts. Section 14 relates to the settlement of disputes by reference to the rules, or to the registrar, or to courts of summary jurisdiction. Section 15 empowers the registrar (or assistant registrar in Scotland or Ireland), on application of one-fifth of the whole number of members, or of 100 members in the case of a society of 1,000 members and not exceeding 10,000, or 500 members in the case of a society of more than 10,000 members, with the consent of the Treasury in every case, to (*a*) appoint one or more inspectors to examine into the affairs of such society, and to report thereon, who may require the production of all or any of the books and documents of the society, and may examine on oath its officers, members, agents, and servants in relation to its business, and may administer such oath accordingly; to (*b*) call a special meeting of the society in such manner and at such time and place as the chief registrar, or such assistant registrar, may direct, and to direct what matters shall be discussed and determined on at such meeting, which shall have all the powers of a meeting called according to the rules of the society, and shall in all cases have power to appoint its own chairman, any rule of the society to the contrary notwithstanding. There are further provisions as to the support of applications for inspection by evidence, as to security for costs, &c. Section 16 refers to change of name and amalgamation of societies, and section 17 to their dissolution. Section 18 details the penalties to be imposed for breach of the Act, and section 19 describes the mode of legal procedure to obtain convictions. There are other miscellaneous provisions as to regulation of proceedings in county courts (20); public auditors (21); fees (22); regulations to be made for carrying out the Act (23); evidence of documents (24); duties of the registrars (25); application of Act to Channel Islands (26). There are four schedules, containing (I) Acts and Enactments repealed; (II) matters to be provided for by the rules of societies registered under this Act; (III) form of statement to be made out by a society carrying on the business of banking; form of bond; and form of receipt to be endorsed on mortgage or further charge; (IV) acknowledgment of registry of society; acknowledgment of registry of amendment of rules.

TRADES UNIONS.

[39 and 40 Victoriæ, cap. 22.—30th June, 1876.]

An Act to amend the Trade Union Act, 1871.

The preamble declares the expediency of amending the Trade Union Act of 1871, and section 1 enacts that this Act and the Act of 1871 are hereafter to be construed as one Act and cited together as "The Trades Union Acts, 1871 and 1876." By section 2, notwithstanding anything contained in section 5 of the Act of 1871, every trade union, whether registered or unregistered, which insures or pays money on the death of a child under ten years of age, is to be deemed to be within the provisions of section 28 of the Friendly Societies Act of 1875. By section 3, the real or personal estate of any branch of a trade union may be vested in the trustees of the union if the rules of the trade union so provide. Section 4 provides that when a

trustee in whose name any stock belonging to a trade union is standing at the Bank of England or Ireland, is absent from the United Kingdom, or becomes bankrupt, lunatic, or dead, or has been removed from his office of trustee, or if it be unknown whether such person is living or dead, the registrar, on application in writing from the secretary and three members of the union or branch, and on proof satisfactory to him, may direct the transfer of the stock into the names of any other persons as trustees for the union or branch; and such transfer shall be made by the surviving or continuing trustees, and if there be no such trustee, or if such trustees refuse or be unable to make such transfer, and the registrar so direct, then by the Accountant-General or Deputy or Assistant Accountant-General of the Bank of England or Bank of Ireland, as the case may be; and the Governors and Companies of the Bank of England and Bank of Ireland respectively are hereby indemnified for anything done by them or any of their officers in pursuance of this provision against any claim or demand of any person injuriously affected thereby. By section 5 the jurisdiction conferred by the Act of 1871 upon the court of summary jurisdiction for the place in which the registered office of a trade union is situate may be exercised either by that court or by the court of summary jurisdiction for the place where the offence has been committed. By section 6, trade unions carrying or intending to carry on business in more than one country of the United Kingdom (viz., in England and Wales, Scotland, or Ireland) is to be registered in the country in which their registered office is situate; but copies of the rules of such unions, and of all amendments of the same, shall, when registered, be sent to the registrar of each of the other countries, to be recorded by him, and until such rules are so recorded the union is not to be entitled to any of the privileges of this Act or the Act of 1871, in the country in which such rules have not been recorded, and until such amendments of rules are recorded the same are not to take effect in such country. Under section 8 no certificate of registration of a trade union is to be withdrawn or cancelled otherwise than by the chief registrar of Friendly Societies in England, or by the assistant registrar for Scotland or Ireland, and only then at the request of the union, or on proof that the certificate has been obtained by fraud or mistake, that it has violated any provisions of this Act, or that it has ceased to exist. By section 9, minors above the age of sixteen may become members of a trade union unless provision to the contrary be made in the rules, and may enjoy all rights of a member but not be a member of the committee of management, nor a trustee, nor treasurer of the trade union. A member of a trade union may, by writing under his hand, delivered at or sent to the registered office of the union, nominate any person not being an officer of the union (unless such officer or servant is the nominator's husband, wife, father, mother, child, brother, sister, nephew, or niece), to whom any moneys payable on the death of such member, not exceeding 50*l.*, shall be paid at his decease, and may from time to time revoke or vary such nomination by a writing under his hand similarly delivered or sent; and on receiving satisfactory proof of the death of a nominator, the trade union shall pay to the nominee the amount due to the deceased member not exceeding the sum aforesaid. Section 11 sanctions the change of name of a trade union with the consent of not less than two-thirds of the total number of members and with the approval in

writing of the chief registrar in England or of the assistant registrar in Scotland or Ireland. By section 12 two or more unions may amalgamate by the consent of not less than two-thirds of the members of each union and with or without the dissolution or division of the funds of the unions. Notice in writing of such change of name or amalgamation duly signed by seven members and countersigned by the Secretary is to be given to the central office of the friendly societies. Section 14 requires that the rules of every trade union are to contain provisions for its dissolution. By section 15 failure to comply with the Act is to render every officer bound to send notices to the registrar, or if there be no such officer, every member of committee liable to a fine of not less than 1*l.* or more than 5*l.* Section 16 gives the following definition of terms: "So much of section 23 of the principal Act as defines the term trade union, except the proviso qualifying such definition, is hereby repealed, and in lieu thereof be it enacted as follows: the term trade union means any combination, whether temporary or permanent, for regulating the relations between workmen and masters, or between workmen and workmen, or between masters and masters, or for imposing restrictive conditions on the conduct of any trade or business, whether such combination would or would not, if the principal Act had not been passed, have been deemed to have been an unlawful combination by reason of some one or more of its purposes being in restraint of trade."

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5. LOCAL GOVERNMENT.

POOR LAW AMENDMENT.

[39 and 40 Victoriæ, cap. 61.—15th August, 1876.]

An Act to provide for the better arrangement of Divided Parishes and other Local Areas, and to make sundry amendments in the Law relating to the Relief of the Poor in England.

The preamble recites that many parishes in England are divided, and some Unions are formed in a manner which renders their arrangements inconvenient, and other Unions are too large in extent for the purpose of the relief of the poor and other local administration; and that the object of the statute is to remedy those "inconveniences," and to provide other amendments which are required in the laws for the relief of the poor in England. By section 1, in cases where any parish is so divided as to have its parts or any of them isolated in some other parishes, the Local Government Board is empowered, after three months' notice, either to constitute separate parishes out of the divided parishes, or to amalgamate some of the parts thereof with the parish or parishes in which the same may be locally included. If one-tenth in number and value of the ratepayers object, then, by section 2, the order is to be only provisional. Under the new order the officers of the several parishes affected thereby are, by section 3, to be required to act as if such parishes had been constituted in the manner directed prior to the issue of such order. By section 4 ecclesiastical divisions and municipal boundaries are not to be affected by this Act, nor the constitution of school districts without the sanction of the Education Department. Section 5 makes provision for

parishes affected by the order which are included in a highway district. By section 6, every parish appointed by the Local Government Board under this Act is to be a parish for which an overseer shall be appointed, and for all other lay and civil purposes the meeting of the inhabitants duly qualified is to be deemed the vestry meeting thereof, and the rector, vicar, or perpetual curate having cure of souls in the greater part is to be chairman, subject to the ordering of the Local Government Board. Section 7 provides for compensation to persons deprived of office or employment by the operation of this Act, and by section 8 an adjustment is to be made as to the parish property and debt. The next division of the Act contains the "Poor Law Amendments." By section 10, husbands and wives in workhouses, when either is infirm, sick, or disabled by any injury, "or above the age of sixty years," may be permitted by the guardians to live together, such cases to be reported to the Local Government Board. By section 11, if it shall appear to the Local Government Board that it is expedient for rectifying or simplifying the areas of management, or for the better administration of relief, a Union may be dissolved. The Local Government Board may (section 12) by their order divide any parish into wards for the election of guardians, and determine the number to be elected: the name of a Union may be changed (section 13), and paupers are not to vote at elections of guardians (section 14). Guardians of Unions and parishes may, by section 15, pay for information required for the effectual discharge of their duties, charging the same to the Union or parish funds, and by section 16 any disagreement as to the amount paid to officers for such information is to be settled by the Local Government Board. If any officer seeks a superannuation allowance, his services as registrar of marriages or sanitary officer shall not prevent him obtaining the same (section 17). A provision in the 7th and 8th Vict., cap. 10, section 25, affording relief to a woman whose husband is beyond the seas, as if she was a widow, is extended by section 18 in the same manner to a married woman living separate from her husband. By section 19, proceedings may be taken against persons who desert their families, and where relieving officers apply for a warrant on the ground that "relief had been applied for on behalf of the wife or child." Orders on the husband of a lunatic to contribute to her support, may be made by the justices of the district, the guardians of which make the application instead of the Justices of the Peace where the husband dwells. Section 21 relates to the registration of births and deaths in workhouses; section 22 enables managers of district or other pauper asylums to contract to receive paupers chargeable to other Unions or parishes than their own; and by section 23, where a trustee or other person is bound to make payment to a pauper, he may pay to guardians of the poor the cost incurred in the relief of such pauper. In bastardy cases, magistrates may, by section 24, award costs to guardians as in other cases. Section 25 provides for the recovery of costs by guardians of a parish in the same manner as by the guardians of a Union. By section 26, when a pauper lunatic is sent from any part of a borough wholly or partly in a Union or parish to a registered hospital or licensed house, the Union is to pay the amount which would have been paid for the lunatic's maintenance in a county asylum, and the balance and extra expenses caused by the patient's removal to be paid by the borough authorities and to be recoverable

from them. With regard to parish apprentices, the provision in the 56th Geo. III, cap. 139, is repealed by section 27, and by section 28, it is now provided that "if any boy, not already an apprentice in the Merchant Service, who or whose parent or parents shall be receiving relief in any Union or parish, be desirous of serving in the Naval Service of Her Majesty, and be forwarded for approval by competent authority for such service, the guardians of the poor of such Union or parish may enable such boy to be so forwarded, and may pay out of their funds such sum, if any, as may be required by the regulations of such service for providing outfit or otherwise, and also such expenses as may be necessary to be incurred for the conveyance of such boy in charge of a proper person to and from the port or place in the United Kingdom at which he may be required to attend for examination, and, if accepted, for entry into such service." There are other provisions in the Act as to settlements (sections 34 to 39), and some "Metropolitan provisions" (sections 40 to 43).

CRUELTY TO ANIMALS.

[39 and 40 Victoriæ, cap. 77.—15th August, 1876.]

An Act to amend the Law relating to Cruelty to Animals.

The preamble recites that it is expedient to amend the law relating to cruelty to animals, which for medical, physiological, or other scientific purposes are subjected, when alive, to experiments calculated to inflict pain. The law as amended is contained in 22 sections. Section 2 declares that a person shall not perform on a living animal any experiment calculated to give pain, except subject to the restrictions imposed by this Act. Any person performing or taking part in performing any experiment calculated to give pain in contravention of this Act shall be guilty of an offence, and liable for a first offence to a penalty not exceeding 50*l.*, and for a second or subsequent offence, at the discretion of the Court, to a penalty not exceeding 100*l.*, or to imprisonment for a period not exceeding three months. Section 3 enforces general restrictions as to the performance of painful experiments on animals. The experiments must be with a view to the advancement by new discovery of physiological knowledge or of knowledge which will be useful for saving or prolonging life or alleviating suffering; the experiment must be performed by a person holding a conditional licence from one of Her Majesty's Principal Secretaries of State, and in the case of a conditional licence, or of experiments for the purpose of instruction in a registered place, the animal must during the whole of the experiment be under the influence of some anæsthetic of sufficient power to prevent its feeling pain; the animal, if the pain is likely to continue after the effect of the anæsthetic has ceased, or if any serious injury has been inflicted upon it, is to be killed before recovery from the influence of the anæsthetic; the experiment is not to be performed as an illustration of lectures in medical schools, hospitals, colleges, or elsewhere, nor for the purpose of attaining manual skill. There are four provisos to the restrictions which are set forth. In section 5 there are special restrictions as to painful experiments on dogs, cats, horses, asses, or mules, which are only to be permitted when no other animal can be

used without frustrating the object of the experiment, &c. Any exhibition to the general public of experiments on living animals is strictly prohibited by section 6 under heavy penalties, and any person "publishing any notice of such intended exhibition by advertisement in a newspaper, placard, or otherwise, is liable to a penalty not exceeding 1*l*." The Secretary of State may by section 8 license any person whom he may think qualified to hold a licence to perform experiments, and may by section 7 insert the place where they are to be performed, and may by section 9 require reports to be made to him of such experiments. The Secretary of State is by section 10 to cause all registered places to be from time to time visited by inspectors, for the purpose of securing a compliance with the provisions of this Act, and the Secretary of State may, with the assent of the Treasury as to number, appoint any special inspectors, or may from time to time assign the duties of such inspectors to such officers in the employment of the Government who may be willing to accept the same as he may think fit, either permanently or temporarily. Any application for a licence and a certificate must under section 11 be signed by one or more of the following persons:—The President of the Royal Society, of the Royal Society of Edinburgh, of the Royal Irish Academy, of the Royal Colleges of Surgeons in London, Edinburgh, or Dublin, of the Royal Colleges of Physicians in London, Edinburgh, or Dublin, of the General Medical Council, of the Faculty of Physicians and Surgeons of Glasgow, or of the Royal Veterinary College, but in the case only of an experiment under anæsthetics with a view to the advancement, by new discovery, of veterinary science, and also by other persons mentioned, a certificate may be given for such time or for such series of experiments. A copy of a certificate is to be forwarded by the applicant to the Secretary of State, but is not to be available until one week after a copy has been forwarded. The Secretary of State may at any time disallow or suspend any certificate given under this (11th) section. A Judge is empowered by section 12 to grant a licence for an experiment when necessary in a criminal case. A Justice may by section 13 grant a warrant on grounds that experiments are made by unlicensed persons in places not registered under the Act, with penalties to be imposed. Offences may by section 14 be prosecuted in a summary manner. A person accused may under section 15 elect to be tried on an indictment, and not by summary jurisdiction. An appeal is given in England to the Sessions under section 16, and the manner of procedure in Scotland and Ireland is pointed out in section 17. By section 22, the Act is not to apply to invertebrate animals, and the 21st section declares that "a prosecution under this Act against a licensed person shall not be instituted except with the assent in writing of the Secretary of State."

WILD FOWL PRESERVATION.

[39 and 40 Victoriæ, cap. 29—24th July, 1876.]

An Act for the Preservation of Wild Fowl.

The preamble to the statute recites that the wild fowl of the United Kingdom, forming a staple article of food and commerce, have of late years greatly decreased in number by reason of their being incon-

siderately slaughtered during the time they have eggs and young, and that the protection afforded, owing to their marketable value, by the the Act 36 of the Queen is insufficient. Section 1 defines the words "wild fowl" as including for the purposes of the Act the different species of avocet, curlew, dotterell, dunbird, dunlin, godwit, greenshank, lapwing, mallard, oxbird, peewit, phalarope, plover, plover's page, pochard, purre, redshank, reeve or ruff, sanderling, sandpiper, sealark, shoveller, snipe, spoonbill, stint, stone-curlew, stonehatch, summer-snipe, teal, thick-knee, whaup, whimbrel, widgeon, wild duck, wild goose, and woodcock. Section 2 enacts that any person killing such wild fowl, or having in his control or possession one recently killed between the 15th of February and 10th of July in any year shall on conviction of any such offence before any justice or justices of the peace in England or Ireland, or before the sheriff or any justice or justices of the peace in Scotland, forfeit and pay for every such wild fowl such sum of money not exceeding one pound as to the said justices or sheriff shall seem meet, together with the costs of the conviction. By section 3, the Home Office may, as to Great Britain, and the Lord Lieutenant as to Ireland, upon application of the Justices in Quarter Session of any county, extend or vary the time named in the Act during which the taking of wild fowl is prohibited, such extension or variation being made by order under the hand of a Secretary of State, and the penalties of the Act are only to be in force during such altered period. In Ireland, publication of the Lord Lieutenant's order in the London or Dublin Gazette, is to be evidence of such order having been made. By section 4, persons offending against this Act may be required to tell their names and abodes, the penalty for refusing to do so, or giving false information, being on conviction of the offence such sum not exceeding 2*l.* (in addition to the penalty named in section 2) as to the convicting sheriff or justice shall seem meet, with the costs of the conviction. By section 5, one-half of this penalty is to be given to the informer, and the other to the poor of the parish in which the offence is committed. Under section 6 provision is made for the trial of offences committed within the Admiralty jurisdiction, when they are to be dealt with, inquired of, tried, and determined in any county or place in the United Kingdom in which the offender shall be apprehended or be in custody, in the same manner in all respects as if they had been actually committed in that county or place. By section 7, when offences are committed in or upon waters forming the boundaries between two counties, districts of quarter sessions or petty sessions, they may be prosecuted before any justice or justices of the peace or sheriff in either of such counties or districts.

POLLUTION OF RIVERS.

[39 and 40 Victoriæ, cap. 75.—15th August, 1876.]

An Act for making further Provision for the Prevention of the Pollution of Rivers.

The principal object of the statute, as declared by the preamble, is "to prevent the establishment of new sources of pollution." There are twenty-two sections, divided into six parts. By section 2 every person who puts or causes to be put or to fall, or knowingly permits to be put, or to fall, or to be carried into any stream, so as either singly

or in combination with other similar acts of the same or any other person to interfere with its due flow, or to pollute its waters, the solid refuse of any manufactory, manufacturing process or quarry, or any rubbish or cinders, or any other waste or any putrid solid matter, is to be deemed to have committed an offence against this Act. In proving interference with the due flow of any stream, or in proving the pollution of any stream, evidence may be given of repeated acts which together cause such interference or pollution, although each act taken by itself may not be sufficient for that purpose. Section 3 makes the causing or permitting to fall or flow any solid or liquid sewage matter into a stream an offence under the Act, and section 4 applies the Act to manufacturing and mining pollutions. The fourth part has reference to the administration of the law. By section 7 sanitary authorities are to afford facilities for factories draining into sewers, and by section 8 those authorities have power to enforce the statute, as also the Lea Conservancy Board. The other provisions, sections 10 to 21, relate to legal proceedings, &c. Offences are, under section 10, to be restrained by summary orders of County Courts, with the right of appeal, under section 11, to the High Court of Justice. The inspectors of the Local Government Board have powers, under section 12, to give certificates that the best practicable means for rendering harmless any sewage matter falling or flowing into any stream are taken, and such certificates are to be held as conclusive evidence of the fact. There are, in sections 21 and 22, provisions as to the execution of the new law in Scotland and Ireland.

SLAVE TRADE.

[39 and 40 Victoriæ, cap. 46—11th August, 1879.]

An Act for more effectually punishing Offences against the Laws relating to the Slave Trade.

Section 1 enacts that any person, being a subject of Her Majesty, or of any Prince or State in India in alliance with Her, committing on the high seas, or in any part of Asia and Africa, specified by Order in Council, an offence against the Indian Penal Code is to be dealt with as if the offence had been committed in any place within British India in which he may be or may be found. Under section 2, if the Governor-General of India in Council shall, at a meeting for making laws and regulations, amend the provisions of the sections 367, 370, and 371, of the said Penal Code, or any of them, or the said 5th chap. thereof, so far as relates to the abatement of any of the offences forbidden by such sections, or make any further provision for preventing or suppressing the making, buying, or selling of slaves, or any of the offences comprised in the said three sections, the Secretary of State for India shall, unless Her Majesty has disallowed such amendment or further provision, lay a copy of the amending Act before each House of Parliament, and after the same shall have lain on the table of both Houses of Parliament for the space of 40 days, it shall be lawful for Her Majesty, unless either House of Parliament shall present an address to Her Majesty to the contrary, to direct by Order in Council that the provisions of the first section of this Act shall apply to the law so amended or enlarged, and the same shall be applicable accordingly. The remaining sections relate to the legal procedure for the carrying out of the Act.

ABSTRACTS OF PARLIAMENTARY AND OTHER OFFICIAL DOCUMENTS.

1. FINANCE, TAXATION, AND CURRENCY.

NATIONAL REVENUE AND EXPENDITURE.—The subjoined Tables show the whole of the RECEIPTS into and PAYMENTS out of the Exchequer in the year ended 31st March, 1876:—

	£
To BALANCE in the Exchequer on the 1st April, 1875	6,265,322
SOURCES OF REVENUE:—	
Customs	20,020,000
Excise	27,626,000
Stamps	11,002,000
Land Tax and House Duty	2,496,000
Property and Income Tax	4,109,000
Post Office	5,950,000
Telegraph Service	1,245,000
Crown Lands (Net)	395,000
Miscellaneous	4,288,693
Total Income	£77,131,693
Income for year estimated in Budget	£75,625,000
Actual income at the Exchequer	77,131,693
Excess of Income over Budget Estimate	1,506,693
Proportion of receipts per head of Population of United Kingdom	£2 7s. 1d.

BRANCHES OF EXPENDITURE:—	
Permanent Charge of Debt:—	£
Interest and Management of the Debt	21,623,312
Terminable Annuities	5,364,487
Interest of Exchequer Bills, &c.	132,049
New Sinking Fund	280,150
Interest on Loans for Local Purposes	43,750
Other Charges on Consolidated Fund:—	
Civil List	406,841
Annuities and Pensions	328,109
Salaries and Allowances	97,930
Courts of Justice	629,652
Miscellaneous Services (Ordinary)	94,556
Localization of the Military Forces	200,000
Payments for voted (Supply) Services:—	
Army Services	14,577,468
,, ,, Charges on account of Troops in India	500,000
Army Purchase Commission	501,638
Navy Services	11,063,449
Miscellaneous Civil Services	13,119,364
Customs and Inland Revenue Departments	2,694,393
Post Office	2,982,000
Telegraph Service	1,022,000
Post Office Packet Service	884,054
Total Ordinary Expenditure	£76,545,208
Charges connected with the purchase of the Suez Canal Shares	76,565
	£76,621,773
Expenditure for year estimated in Budget	£76,741,000
Actual Payments out of Exchequer	76,621,773
Less than Estimates by	119,227
Proportion of Payments per head of population of United Kingdom	£2 6s. 10d.

CUSTOMS AND EXCISE.—The Produce of the two great sources of PUBLIC REVENUE, CUSTOMS and EXCISE, which together contribute considerably more than One-Half to the NATIONAL INCOME of the UNITED KINGDOM, was as follows in the financial year ending March 31, 1876, the sums representing Gross Receipts:—

CUSTOMS DUTIES on Articles usually contributing not less than £1,000 Annually.	Gross Receipts. £	s.	d.
Beer, Spruce	2,586	14	7
— Of other Sorts, including Mum	1,197	2	11
Chicory	64,616	14	8
Cocoa, Cocoa Husks, and Chocolate	43,628	15	10
Coffee	206,696	8	7
Currants	309,435	6	6
Figs	32,275	14	4
Plate, Gold, and Silver	5,284	11	5
Plums, Dried or Preserved, French Plums and Prunelloes	4,524	17	11
Prunes	6,464	10	3
Raisins	132,474	5	11
Spirits, Colonial and Foreign:—			
Rum	2,656,943	6	9
Brandy	2,352,310	10	0
Geneva	116,214	19	5
Of other sorts	1,018,966	12	11
Tea	3,709,450	6	11
Tobacco and Snuff	7,835,209	1	11
Wine	1,755,710	19	2
All other Articles	2,302	2	1
Charges on delivery from the Bonded Warehouses	37,643	16	9
	£20,293,936	18	10
Duties collected at the Isle of Man	47,565	12	11
Gross Produce	£20,341,502	11	9
Deductions on account of Drawbacks, Repayment on Over Entries, &c.	6,383	0	0
Net Produce	£20,196,690	11	3

EXCISE DUTIES.	Gross Receipts. £	s.	d.
Chicory	2,987	19	10
Licences, viz.:			
Auctioneers, Appraisers, &c.	71,904	0	0
Beer, Cider, and Perry	369,646	7	0¾
Brewers	430,825	10	3
Dog	343,398	5	0
Establishment, viz.:			
Armorial Bearings	83,527	10	0
Carriages	551,139	19	0
Horses	—		
Male Servants	198,651	0	0
Game	192,686	0	0
Gold and Silver Plate	40,766	16	0
Gun	76,297	0	0

EXCISE DUTIES, contd.	Gross Receipts. £	s.	d.
Hawkers and Pedlars	21,968	4	0
Maltsters	15,828	14	3
Medicine Vendors	3,797	15	0
Pawnbrokers	32,250	0	0
Refreshment House	7,655	3	1½
Spirit (Distillers, Dealers, and Publicans)	799,440	13	2½
Tobacco	86,483	4	7½
Wine and Sweets	206,664	10	1
Other than the foregoing	7,220	2	6½
Malt	7,887,698	19	3½
Railways	736,369	6	2¼
Spirits	15,625,834	12	1
Sugar used in Brewing	506,797	19	3¼
Total Gross Receipts	£28,299,819	10	9½
Deductions on account of Drawbacks, Discounts, and Parliamentary Allowances, Allowances and Repayments on Overcharges, &c.	£730,496	16	5¾
Net Produce	£27,569,363	13	4

STAMPS.—The following table gives the gross receipts from Stamps in the United Kingdom during the financial year ended the 31st of March, 1876:—

Heads of Duty.	Gross Receipts. £	s.	d.
Deeds and other Instruments, not included under the following heads	2,224,247	16	5½
Probates of Wills and Letters of Administration	2,390,339	2	0
Bills of Exchange	869,131	10	4
Bankers' Notes	896	17	6
Composition for the Duties on the Bills and Notes of the Banks of England and Ireland, and of Country Bankers	140,344	2	10
Receipts, Drafts and other 1*d.* Stamps	809,865	5	4
Marine Insurances	120,518	13	2
Licences and Certificates	139,997	0	0
Medicine	123,136	9	10½
Legacies and Successions	3,548,966	15	8½
Gold and Silver Plate	86,293	0	4½
Cards	13,810	18	9
Patents for Inventions	165,511	0	0
Fire Insurance—arrears	49	1	6
	£10,633,107	13	9½
Fee Stamps, viz.:			
Admiralty Court	4,869	9	6
Bankruptcy Court	70,604	4	6
Chancery Court	92,537	1	8
Chancery Fund	3,707	17	0

Heads of Duty.	Gross Receipts. £	s.	d.
Chimney Sweepers Certificate	125	0	0
Civil Bill Fund	17,951	9	0
Civil Service Commission	3,143	11	0
Coal Mines Regulation	750	15	0
Common Law Courts (England)	55,350	3	7
Companies Registration	21,103	10	0
Copyhold, &c., Commission	7,003	7	6
Crown Office	5,629	4	8
Divorce and Matrimonial Causes	4,642	0	0
Explosive Substances	450	0	0
Great Seal Patent	280	0	0
Judgments Registry Fund	3,200	19	0
Judicature	67,404	0	0
Land Registry	604	9	6
Law Courts, Scotland	4,822	15	0
Law Fund	10,808	1	0
London Gazette	25,526	7	0
Lord Chancellor's Presentation	503	0	0
Naturalisation	353	0	0
Pedlars' Certificates (Metropolis)	1,351	6	6
Police Courts	8,270	6	6
Probate Court	161,306	2	6
Public Record	597	15	0
Railway Commission	621	5	0
Record of Title	26	16	0
Register House, Scotland	43,976	12	4
Registration of Deeds	14,462	7	6
	£631,982	16	3
Gross Total	£11,265,090	10	0½
Drawbacks, Discounts, Allowances, &c.	£241,716	8	3¼
Net Produce	£11,023,374	1	9¼

NATIONAL DEBT.—The following table shows the total amount of the Funded Debt of the United Kingdom on the 31st of March, 1875, the Debt created and reduced in the year ended 31st March, 1876, and the balance at the latter date:—

	£	s.	d.
Total Funded Debt on 31st March, 1875	714,797,715	0	0
Debt created in year ended 31st March, 1876	345,252	0	0
Total	715,142,967	0	0
Debt reduced in year ended 31st March, 1876	1,485,450	0	0
Balance, being total Funded Debt on 31st March, 1876	713,657,517	0	0

The following table shows the state of the above Public Funded Debt of the United Kingdom on 31st March, 1876:—

Great Britain.	Capitals. £	s.	d.
Capital Funded Debt:—			
New Annuities, at 2½ per cent.	3,783,201	0	0
Exchequer Bonds, created per 16 Vict., c. 23, at 2½ per cent.	418,300	0	0
Total, at 2½ per cent	£4,201,321	0	0
Debt due to the Bank of England, at 3 per cent.	11,015,100	0	0
Consolidated Annuities, at 3 per cent.	389,017,152	0	0
Reduced Annuities, at 3 per cent.	94,349,593	0	0
New Annuities, at 3 per cent.	179,691,942	0	0
Total, at 3 per cent.	£674,073,788	0	0
New Annuities, at 3½ per cent.	225,746	0	0
Total, Great Britain	£678,500,855	0	0

Ireland.	£	s.	d.
New Annuities, at 2½ per cent.	2,330	0	0
Debt due to the Bank of Ireland, at 3 per cent.	2,630,769	0	0
Consolidated Annuities, at 3 per cent.	5,322,931	0	0
Reduced Annuities, at 3 per cent.	140,038	0	0
New Annuities, at 3 per cent.	27,060,592	0	0
Total, at 3 per cent.	£35,154,331	0	0
Total, Ireland	£35,156,661	0	0
Total Capital of the Funded Debt of the United Kingdom, on 31st March, 1876	713,657,517	0	0

CHARGES ON NATIONAL DEBT.—The following table shows the charges on the Debt for the financial year ended the 31st of March, 1876:—

	Annual Charge. £	s.	d.
On Total Debt remaining on 31st March, 1875:—			
Funded Debt	21,423,996	0	0
Terminable Annuities:			
Annuities, per 18 Vict., c. 18, expiring 5 April, 1885	116,000	0	0

	Annual Charge. £ s. d.
Annuities, per 23 & 24 Vict., c. 109, and subsequent Acts, expiring 5 April, 1885 (Fortifications) . .	545,405 0 0
Annuity, per 26 Vict., c. 14, expiring 5 April, 1885 . . .	9,983 0 0
Annuities, per 32 & 33 Vict., c. 59, and 29 Vict., c. 5, expiring at various dates in 1885 (payable yearly)	3,617,845 0 0
Annuities, per 35 & 36 Vict., c. 68, expiring 29th March, 1885, "The Military Forces Localization Act"	65,486 0 0
Red Sea and India Telegraph Company's Annuity, 25 & 26 Vict., c. 39, expiring 4th August, 1908 .	36,000 0 0
Sinking Fund Annuity on New 2½ per Cents., per 16 Vict., c. 23	6,906 0 0
Annuities for Terms of Years, per 10 Geo. 4, c. 24, and 3 Will. 4, c. 14, expiring at various periods	46,688 0 0
Life Annuities, per 10 Geo. 4, c. 24, 3 Will. 4, c. 14, 16 & 17 Vict. c. 45, and 27 & 28 Vict. c. 43 . . .	914,956 0 0
Exchequer Tontine Annuities, per 29 Geo. 3	14,986 0 0
Management:	
Great Britain . . .	212,048 18 8
Ireland	10,012 3 9
Total amount of charge on Funded Debt 31st March, 1875 . . .	27,020,314 0 0
Charges on Debt created in the year ended 31st March, 1876:—	
Funded Debt:—	
Capital created by Act 36 & 37 Vict. c. 83, "The Telegraph Act, 1873" . . .	2,400 0 0
Capital created by Act 39 Vict. c. 5, "The Telegraph (Money) Act, 1876" . . .	7,957 0 0
Terminable Annuities:—	
Annuities (expiring 1885) granted per 32 & 33 Vict., c. 76 (Fortifications) . .	298,86 0 0
Annuities for Terms of Years, per 10 Geo. 4, c. 24	941 0 0
Life Annuities, per 10 Geo. 4, c. 24, 3 Will. 4, c. 14, 16 & 17 Vict., c. 45, and 27 & 28 Vict., c. 43.	66,365 0 0
Total charge on Debt created in the year ended 31st March, 1876.	107,550 0 0
Gross total charges .	£27,127,865 0 0

COINAGE OF THE ROYAL MINT.—The amount of gold, silver, and copper moneys coined at the Royal Mint in each year from 1859 to 1875 was as follows:—

Years.	Gold.	Silver.	Copper.
	£	£	£
1859	2,649,509	647,064	8,512
1860	3,121,709	218,403	37,990
1861	8,190,170	209,484	273,578
1862	7,836,413	148,518	352,800
1863	6,997,212	161,172	151,648
1864	9,535,597	535,194	18,069
1865	2,367,614	501,732	57,493
1866	5,076,676	493,416	50,624
1867	496,397	193,842	33,301
1868	1,653,384	301,356	16,328
1869	7,372,204	76,428	20,832
1870	2,313,384	336,798	32,704
1871	9,919,656	701,514	7,616
1872	15,261,442	1,243,836	47,413
1873	3,384,568	1,081,674	46,218
1874	1,461,565	890,604	65,632
1875	243,264	594,000	69,813

STATE ANNUITANTS AND PENSIONERS.—The finance accounts of the United Kingdom for the year ended the 31st of March, 1876, supply a detailed statement of the amount issued from the Exchequer during the year for payment of annuities and pensions charged on the Consolidated Fund. The first section includes the annuities to the members of the Royal family, each of which has its special Act of Parliament as the authority for its payment. The first of these—the annuity to the Duchess of Cambridge—carries us back to the fifty-eighth year of George III., and the last—the annuity to Prince Leopold—brings us down to the thirty-seventh year of Queen Victoria. The sums thus paid are:—The Crown Princess of Prussia, 8,000*l.*; the Princess Louis of Hesse, 6,000*l.*; the Prince of Wales, 40,000*l.*; the Princess of Wales, 10,000*l.*; the Duke of Edinburgh, 15,000*l.* and 10,000*l.*, the latter amount being the sum voted "to provide for the establishment of his Royal Highness the Duke of Edinburgh and her

Imperial and Royal Highness the Grand Duchess Marie Alexandrovna of Russia, and to settle an annuity on her Imperial Highness," although the name of the Duchess does not appear, as that of the Princess of Wales does, upon the official list; Princess Christian, 6,000*l.*; Princess Louise (Marchioness of Lorne), 6,000*l.*; the Duke of Connaught, 15,000*l.*; Prince Leopold, 15,000*l.*; the Duchess of Cambridge, 6,000*l.*; the Duchess of Mecklenburg-Strelitz (Princess Augusta), 3,000*l.*; the Duke of Cambridge, 12,000*l.*; and the Princess of Teck (Princess Mary of Cambridge), 5,000—making a total of 157,000*l.* The next class of pensions is that for military and naval services, which are divisible into several sections, the first being hereditary, the second to the first receiver and his immediate successor only, and the third for life. In the first section there is the annuity of 4,000*l.* to the Duke of Marlborough, originally voted in Queen Anne's reign; Lord Rodney and Lady Rodney, 1,000*l.* each; Earl Nelson, 3,500*l.*, and Countess Nelson, 1,500*l.*; Viscount Exmouth, 2,000*l.*; Earl Amherst, 3,000*l.* In the second section we find the Duke of Wellington credited with 4,000*l.*; Viscount Combermere, 2,000*l.*; Lord Seaton, 2,000*l.*; Lord Keane, 2,000*l.*; Lord Hardinge, 3,000*l.*; Lord Gough, 2,000*l.*; Lord Raglan, 2,000*l.*; and Lord Napier of Magdala, 2,000*l.* The life annuities are:—Viscount St. Vincent, 3,000*l.*; Lady Raglan, 1,000*l.*; Sir W. Fenwick Williams, Bart., 1,000*l.*; Sir H. M. Havelock, Bart., 1,000*l.*; and Lady Havelock, 1,000*l.* The pensions for political and Civil services come next on the list. At the head of these stands the name of Viscount Eversley, the ex-Speaker of the House of Commons, who has a life pension of 4,000*l.*; and the Countess of Elgin and the Countess of Mayo, widows of Indian Viceroys, who receive 1,000*l.* each per annum. After these special pensions are three of the first class to Cabinet Ministers—Sir George Grey, Mr. Milner Gibson, and Mr. Walpole of 2,000*l.* each, Lord Beaconsfield's being suspended during his tenure of office. The annuities of the second class are 1,200*l.* to Mr. C. P. Villiers, late President of the old Poor Law (now the Local Government) Board, and 1,200*l.* to the late Mr. Headlam, Judge Advocate-General, which was, however, reduced by his receipt of other emoluments. In the third class the only annuity is that of 1,200*l.* to Lord Clarence Paget as a former First Secretary of the Admiralty; and in the fourth class there are two pensions of 1,000*l.* to late second secretaries of the same department—Admiral W. A. Baillie-Hamilton and Mr. W. G. Romaine. These, with pensions of 1,200*l.* to Mr. Maberly and Mr. Macaulay, ex-Commissioners of Audit, bring the pensions for Civil and political services up to 19,295*l.* Next comes a list of pensions for judicial services in Great Britain, commencing with ex-Lord Chancellors, which includes a moiety of 5,000*l.* paid to the late Lord St. Leonards to the day of his death, and 5,000*l.* each to Lords Chelmsford, Hatherley, and Selborne. Lord Cairns's name is on the list, but his pension is suspended while he is in office. Among the other pensions paid during the year, some of which have since lapsed owing to the death of the recipients, we find 3,750*l.* to Sir W. Erle, 3,500*l.* to Sir J. T. Coleridge, 2,856*l.* to Sir E. V. Williams, 3,500*l.* each to Sir J. B. Byles and Sir Samuel Martin, 3,198*l.* to Sir H. S. Keating, 1,980*l.* to Sir G. E. Honyman, 3,500*l.* each to Lord Penzance, Sir R. T. Kindersley, and Sir John Stuart, and pensions of 800*l.* or 1,000*l.* to retired county-court judges, bringing up the amount on this head to 58,718*l.* The pensions for judicial services in Ireland, including 3,692*l.* to Sir Joseph Napier and Lord O'Hagan, as ex-Lords Chancellor, amount to 15,848*l.* The pensions for diplomatic services, some of which are now charged to the Civil Service Estimates, amount to 13,392*l.*, and include 1,786*l.* to Lord Stratford de Redcliffe, 1,700*l.* to Earl Cowley, and 1,700*l.* to Lord Napier and Ettrick. Account is also given of three hereditary pensions: to the heirs of the Duke of Schomberg 2,160*l.*, the Earl of Bath 1,200*l.*, and the heirs and descendants of John Penn (for ever) 4,000*l.* The miscellaneous pensions consist of allowances to the survivors of the establishments of the late Sovereigns, including the servants of Queen Charlotte 358*l.*, of George III. 10*l.*, and of Queen Caroline 15*l.* (this last annuity having terminated on the 5th of April, 1875); and pensions of 10,652*l.* formerly on the Civil List of George IV. and William IV. The miscellaneous pensions for Ireland include 32*l.* to persons who suffered by the Rebellion in 1798, and 2,671*l.* formerly charged on the Irish Civil List.

UNFUNDED DEBT.—The following statement shows the total amount of Unfunded Debt in Exchequer Bills and Exchequer Bonds outstanding on the 1st April, 1875; the amounts issued and paid off in the year to 31st March, 1876, and the total amount outstanding on the last-mentioned date:—Amount of the Unfunded Debt outstanding on 1st April, 1875: Exchequer Bills, 4,239,300*l.*; Exchequer Bonds, 1,000,000*l.* Amount issued in the year ended 31st March, 1876, viz.: Exchequer Bills:—Nil. Exchequer Bonds, 5,500,000*l.* Total—Exchequer Bills, 4,239,300*l.*; Exchequer Bonds; 6,500,000*l.* Amount paid off in the same period, viz.: Exchequer Bills:—Paid off in money, 37,500*l.*; Exchequer Bonds:—Nil. Amount outstanding: Exchequer Bills, 4,201,800*l.*; Exchequer Bonds, 6,500,000*l.* Total amount of the Unfunded Debt on 31st March, 1876, 10,701,800*l.*

2. GENERAL COMMERCE AND NAVIGATION.

NAVIGATION RETURNS.—The subjoined table shows the tonnage of British and Foreign vessels (sailing and steam) entered and cleared, *with cargoes*, at ports in the United Kingdom, from and to foreign countries and British Possessions, from 1859 to 1875:—

Years.	Entered.			Cleared.		
	British.	Foreign.	Total.	British.	Foreign.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1859 ..	5,391,925	3,698,718	9,090,643	6,222,746	4,021,217	10,243,963
1860 ..	5,760,537	4,294,444	10,054,981	6,358,917	4,424,020	10,782,937
1861 ..	6,307,737	4,297,442	10,605,179	6,841,808	4,477,996	11,319,804
1862 ..	6,591,654	4,149,154	10,740,808	7,400,454	4,309,395	11,709,849
1863 ..	7,302,039	3,835,319	11,137,358	7,961,008	3,926,797	11,887,805
1864 ..	7,813,179	3,488,931	11,302,110	8,596,234	3,576,540	12,172,774
1865 ..	8,356,914	3,801,780	12,158,694	9,056,729	3,770,422	12,827,151
1866 ..	9,215,820	4,061,370	13,277,190	9,954,147	4,055,947	14,010,094
1867 ..	9,356,814	3,984,634	13,341,448	10,586,058	4,261,523	14,847,581
1868 ..	9,572,450	4,279,207	13,851,657	10,902,171	4,570,848	15,473,019
1869 ..	10,042,182	4,444,518	14,486,700	11,313,757	4,603,227	15,916,984
1870 ..	10,308,952	4,601,790	14,910,742	11,934,087	4,779,851	16,713,938
1871 ..	11,250,120	5,205,222	16,455,342	13,396,583	5,650,872	19,047,455
1872 ..	12,139,805	5,766,135	17,905,940	13,574,471	5,673,881	19,248,352
1873 ..	12,474,912	6,320,145	18,795,057	13,653,c30	5,486,335	19,139,365
1874 ..	12,751,128	6,330,278	19,081,406	14,010,786	5,742,701	19,753,487
1875 ..	12,852,351	6,187,577	19,039,928	14,454,989	5,958,750	20,413,739

IMPORTS INTO THE UNITED KINGDOM.—The following table gives the quantities of the chief articles imported into the United Kingdom in the year ended the 31st of December, 1875:—

Articles.		Quantity.
Animals:—		
Oxen, Bulls, Cows, and Calves	No.	263,684
Sheep and Lambs	,,	985,652
Bacon and Hams	Cwts.	2,638,875
Beef	,,	215,581
Bones, except Whalefins	Tons	104,971
Brimstone	Cwts.	1,117,734
Bristles	Lbs.	2,558,996
Butter	Cwts.	1,467,870
Candles, Stearine	,,	104,962
Caoutchouc	,,	153,564
Cheese	,,	1,627,748
Clocks	No.	518,813
Cocoa	Lbs.	15,873,624
Coffee	Cwts.	1,589,732
Corn, Wheat	,,	51,876,517
—— Barley	,,	11,049,476
—— Oats	,,	12,435,888
—— Maize	,,	20,438,480
—— Other kinds	,,	5,502,180
—— Flour of Wheat	,,	6,136,083
—— —— Of other kinds.	,,	83,018
Total of Corn	,,	107,521,642
Cotton, Raw	,,	13,324,564
Dyeing (or Tanning) Stuffs:—		
Cochineal, Granilla, and Dust	Cwts.	40,941
Cutch and Gambier	Tons	28,845
Garancine	Cwts.	25,865
Indigo	,,	59,608
Madder	,,	38,241
Madder Root	,,	63,981
Shumach	Tons	14,686
Valonia	,,	24,434
Eggs	No.	741,223,560
Fish	Cwts.	840,090
Flax and Hemp:—		
Flax, Dressed and Undressed	,,	1,464,735
Tow or Codilla of Flax and Hemp	,,	374,566
Hemp and other like Substances (except Jute), Dressed and Undressed	,,	1,321,559
Jute	,,	3,416,617
Fruits:—		
Currants	,,	1,057,704
Raisins	,,	548,112
Oranges and Lemons	Bush.	2,869,631
Glass of all Kinds	Cwts.	983,677
Guano	Tons	114,454
Gutta-percha	Cwts.	19,627
Hair:—		
Goats' Hair or Wool	Lbs.	6,798,217
Hides, Tanned and Untanned	Cwts.	1,583,905
Hops	,,	256,444

Articles.		Quantity.
Lard	Cwts.	540,244
Leather Gloves	Pairs	22,636,584
Meat, Salted or Fresh	Cwts.	144,954
— Preserved, other than Salted	,,	171,373
Metals:—		
Copper Ore and Regulus	Tons	86,569
Copper, Unwrought and part Wrought, and old Copper	Cwts.	824,500
Iron, in Bars	Tons	89,822
Iron and Steel Wrought or Manufactured	Cwts.	1,159,762
Lead, Pig and Sheet	Tons	79,825
Tin, in Blocks, Ingots, Bars, or Slabs, and Regulus	Cwts.	335,758
Zinc, Crude, in Cakes	Tons	22,638
—— Manufactures	Cwts.	304,635
Oil, Fish	Tuns	19,359
— Palm	Cwts.	904,562
— Cocoa Nut	,,	219,158
— Olive	Tuns	35,453
— Seed	,,	19,061
— Turpentine	Cwts.	293,402
Oil Seed Cake	Tons	180,379
Paper, for Printing or Writing	Cwts.	187,964
Petroleum, Unrefined	Galls.	353,808
—— Refined	,,	19,087,131
Pork	Cwts.	266,663
Potatoes	,,	4,696,132
Pyrites of Iron or Copper	Tons	537,555
Rags and Paper-making Materials:—		
Rags	Tons	15,792
Esparto and other Materials	,,	153,180
Rice, not in the Husk	Cwts.	6,719,894
— In the Husk	Qrs.	16,601
Rosin	Cwts.	1,026,076
Saltpetre	,,	282,550
—— Cubic Nitre	,,	3,316,027
Seeds:—		
Clover and Grass	,,	307,521
Cotton	Tons	202,205
Flax and Linseed	Qrs.	1,961,987
Rape	,,	496,541
Silk Knubs or Husks and Waste	Cwts.	33,787
Silk, Raw	Lbs.	4,487,837
—— Thrown	,,	110,010
Skins:—		
Sheep and Lamb, Undressed	No.	7,165,342
Skins, Tanned, Tawed or Dressed	,,	4,913,696
Seal	,,	629,723
Goat, Undressed	,,	1,397,225
—— Tanned, Tawed or Dressed	,,	5,393,504
Spices:—		
Cinnamon	Lbs.	1,234,567
Pepper	,,	29,399,020
Of all other sorts	,,	15,657,282

Articles.		Quantity.
Spirits:—		
Rum	Pf. Gals.	8,816,654
Brandy	,,	4,069,993
Other Foreign and Colonial Spirits	,,	3,200,651
Total of Spirits	,,	16,087,298
Sugar, Refined and Sugar Candy	Cwts.	2,860,776
—— Raw	,,	16,264,711
—— Molasses	,,	768,410
Tallow and Stearine	,,	967,396
Tea	Lbs.	197,505,316
Teeth, Elephants', Sea-Cow, and Sea Horse	Cwts.	16,258
Tobacco, Manufactured, Cigars, and Snuff	Lbs.	3,344,607
—— Unmanufactured	,,	48,943,559
Wine	Gals.	18,429,305
Wood and Timber:—		
Hewn	Loads	1,695,022
Sawn or Split	,,	3,305,390
Staves	,,	92,572
Mahogany	Tons	80,705
Wool,—Sheep, Lamb, Alpaca, and the Llama Tribe	Lbs.	365,065,578
Woollen Rags	Tons	25,415
Woollen and Worsted Yarn:—		
Berlin Wool and Yarn used for Fancy Purposes	Lbs.	727,214
Yarn for Weaving	,,	11,700,928
Yeast, Dried	Cwts.	162,525

EXPORTS OF HOME PRODUCE FROM THE UNITED KINGDOM.—The following table shows the quantities of the chief articles of British and Irish produce and manufactures exported from the United Kingdom in the year ended the 31st of December, 1875:—

Principal Articles.		Quantity.
Alkali	Cwts.	5,022,764
Animals: Horses	No.	3,135
Arms and Ammunition:—		
Firearms (Small)	No.	317,294
Gunpowder	Lbs.	15,045,695
Bags, Empty	Dozs.	3,680,073
Beer and Ale	Brls.	504,511
Books, Printed	Cwts.	85,777
Butter	,,	39,266
Candles, of all sorts	Lbs.	5,315,696
Carriages, Railway	No.	4,271
Cement	Cwts.	4,919,646
Cheese	,,	21,332
Coals, Cinders, and Fuel	Tons	14,544,916
Cordage and Twine	Cwts.	111,232
Corn: Wheat	,,	97,017
—— Wheat Flour	,,	26,841
Cotton Yarn	Lbs.	215,609,580

Principal Articles.		Quantity.
Cotton Manufactures:—		
Piece Goods, White or Plain	Yds.	2,549,145,807
——— Printed, Checked, or Dyed	,,	1,001,035,569
———, of Mixed Materials	,,	12,280,790
Total of Piece Goods	,,	3,562,462,166
Stockings	Doz. Prs.	1,124,988
Thread for Sewing	Lbs.	10,403,494
Fish: Herrings	Brls.	684,755
Glass: Plate	Sq. Ft.	1,609,180
—— Flint	Cwts.	104,576
—— Common Bottles	,,	661,883
—— Of other Sorts	,,	114,524
Hats of all Sorts	Dozs.	757,686
Leather, Tanned, Unwrought	Cwts.	168,147
—— Wrought, Boots and Shoes	Lbs.	462,840
—— Of other Sorts	,,	1,879,560
Linen and Jute Yarn:		
Linen Yarn	,,	27,887,681
Jute Yarn	,,	15,942,618
Linen and Jute Manufactures:—		
Linen Manufactures:		
White or Plain	Yds.	186,763,770
Printed, Checked, or Dyed	,,	13,742,124
Sailcloth and Sails	,,	4,067,278
Total of Piece Goods	,,	204,573,172
Thread for Sewing	Lbs.	2,757,886
Jute Manufactures	Yds.	101,105,579
Metals:—		
Iron, Old, for remanufacture	Tons	21,610
—— Pig, and Puddled	,,	947,827
—— Bar, Angle, Bolt, and Rod	,,	276,068
—— Railroad, of all Sorts	,,	545,981
—— Wire	,,	42,221
—— Hoops, Sheets, and Boiler Plates	,,	204,483
—— Tinned Plates	,,	138,363
—— Cast or Wrought, and all other manufactures	,,	239,869
—— Steel, unwrought	,,	29,858
—— Manufactures of Steel, or of Steel and Iron combined	,,	11,026
Total of Iron and Steel	,,	2,457,306
Copper, Unwrought:—		
Ingots, Cakes or Slabs	Cwts.	222,873

Principal Articles.		Quantity.
Copper, Wrought or partly Wrought:—		
Mixed or Yellow Metal	Cwts.	277,547
Of other Sorts	,,	235,289
Brass of all Sorts	,,	90,033
Lead, Pig, Sheet and Pipe	Tons	35,398
Tin, Unwrought	Cwts.	104,269
Zinc, Wrought and Unwrought	,,	97,160
Oil, Seed	Gals.	15,612,828
Paper (other than Hangings)	Cwts.	318,895
Salt	Tons	917,514
Silk Manufactures:—		
Broad Piece Goods	Yds.	3,654,660
Soap	Cwts.	251,012
Spirits, British	Galls.	1,096,544
Sugar, Refined	Cwts.	972,263
Wool, Sheep and Lambs'	Lbs.	10,536,523
Woollen and Worsted Yarn	,,	31,723,627
Woollen and Worsted Manufactures:—		
Cloths, Coatings, &c., Unmixed and Mixed	Yds.	42,058,354
Flannels, Blankets, Blanketing, and Baizes	,,	16,109,787
Worsted Stuffs, Unmixed and Mixed	,,	251,845,549
Carpets and Druggets	,,	7,522,660

Exports of Foreign and Colonial Merchandise from the United Kingdom.—The following table gives the quantity of the exports of foreign and colonial merchandize from the United Kingdom, in the year ended the 31st of December, 1875:—

Articles.		Quantity.
Bark, Peruvian	Cwts.	31,575
Caoutchouc	,,	69,757
Chemical Manufactures and Products	Value	£136,077
Cocoa	Lbs.	10,464,149
Coffee	,,	135,274,983
Corn, Wheat	Cwts.	74,040
—— Wheat Meal or Flour	,,	13,366
Cotton, Raw	,,	2,346,309
Cotton Manufactures:—		
Piece Goods	Pieces	281,834
Other Articles	Value	£109,165
Drugs, Unenumerated	,,	295,248
Dyeing Stuffs:—		
Cochineal, Granilla, and Dust	Cwts.	25,277
Indigo	,,	56,800
Madder	,,	710
Madder Root	,,	429

Articles.		Quantity.
Flax and Hemp:—		
Flax, Dressed and Undressed. . .	Cwts.	30,232
Tow or Codilla of Hemp and Flax .	,,	27,734
Hemp and other like Substances (except Jute), Dressed and Undressed. . . .	,,	145,611
Jute	,,	1,050,389
Fruit:—		
Currants	,,	150,420
Raisins	,,	98,939
Guano	Tons	42,005
Hair, Manufactures of, and of Goats' Wool	Val.	£23,910
Hides, Tanned and Untanned . . .	Cwts.	438,145
Metals:—		
Copper, Unwrought, Part Wrought, and old Copper .	Tons	14,691
Iron in Bars, Unwrought . . .	,,	34,330
Zinc, Crude, in Cakes	,,	373
Tin, in Blocks, Ingots, Bars, or Slabs, and Regulus	Cwts.	84,484
Oil, Palm	,,	436,161
—— Cocoa Nut . . .	,,	210,249
—— Olive	Tuns	2,588
Opium	Lbs.	298,556
Quicksilver	,,	2,443,397
Rice, not in the Husk .	Cwts.	3,306,719
Saltpetre	,,	38,730
——— Cubic Nitre .	,,	66,793
Seeds, Flax and Linseed	Qrs.	44,681
——— Rape	,,	157,021
Silk, Raw	Lbs.	2,551,417
—— Thrown	,,	87,924
Silk Manufactures . .	Val.	£328,426
Spices, Cinnamon . .	Lbs.	1,159,362
——— Pepper. . . .	,,	20,211,449
Spirits:—Proof		
Rum	Gallons	1,583,156
Brandy	,,	247,117
Geneva, and other Foreign and Colonial Spirits. .	,,	1,300,192
Total of Spirits	,,	3,130,465
Sugar, Foreign, Refined, and Candy .	Cwts.	266,124
——— Unrefined . . .	,,	484,820
——— Molasses . . .	,,	86,982
Tea	Lbs.	32,226,698
Teeth, Elephants', Sea Cow, and Sea Horse	Cwts.	7,546
Tobacco, Stemmed . .	Lbs.	872,867
——— Unstemmed. .	,,	12,124,835
——— Manufactured, viz:—		
Cigars.	Lbs.	255,160
Other Sorts	,,	1,407,347
Wine	Gallons	1,689,989
Wool, Sheep, Lamb, Alpaca, and Llama	Lbs.	172,075,439

Export Markets of the United Kingdom.—The following table, compiled from Returns of the Board of Trade, gives the declared value of the British and Irish produce exported from the United Kingdom to Foreign countries and British possessions in the year ended the 31st of December, 1875, first taking the exports to foreign countries:—

I. Foreign Countries.

Countries.	Value.
	£
Russia, Northern Ports . . .	6,786,123
——— Southern Ports . . .	1,273,401
Sweden and Norway	4,538,455
Denmark and Iceland . . .	2,323,707
——— Danish West Indies.	379,524
Germany	23,287,883
Holland	13,118,691
——— Java, and other Possessions in the Indian Seas	1,735,996
Belgium	5,781,938
France	15,357,127
——— Algeria	155,676
——— Possessions in Senegambia	16,514
——— Possessions in India .	7,290
Portugal	2,563,067
——— Azores and Madeira.	203,992
Spain	3,430,343
—— Canary Islands . . .	196,887
—— Fernando Po	4,373
—— West India Islands . .	2,630,634
—— Phillipine Islands . .	930,230
Italy	6,766,698
Austrian Territories . . .	897,069
Greece	938,456
Turkey	5,889,905
——— Wallachia and Moldavia	1,054,744
Egypt	2,945,846
Morocco	342,420
United States.	21,868,279
Mexico	884,901
Central America	846,653
Haiti and San Domingo. . .	693,290
New Granada (United States of Columbia)	919,143
Venezuela	733,403
Ecuador	130,205
Brazil	6,869,491
Uruguay	713,830
Argentine Republic	2,386,002
Chili	2,207,418
Peru	1,594,499
China (exclusive of Hong Kong)	4,928,500
Japan.	2,460,227
Western Coast of Africa . .	773,926
Other Countries	807,044
Total of Foreign Countries .	152,373,800

II. British Possessions.

Countries.	Value. £
Channel Islands	641,050
Gibraltar	969,222
Malta	796,346
Ionian Islands (ceded to Greece 1st June, 1864)	—
North American Colonies:— British Columbia, Hudson's Bay Company Settlements, Canada, New Brunswick, Nova Scotia, Prince Edward Island	8,414,099
Newfoundland	622,484
Total of North American Colonies	9,036,583
West India Islands and Guiana	2,984,008
British Honduras	126,481
Australia:—	
West Australia	161,881
South Australia	1,984,579
Victoria	6,538,795
New South Wales	5,584,638
Queensland	1,123,214
Tasmania	244,044
New Zealand	3,854,090
Total of Australia	19,491,241
British India	24,246,406
The Straits Settlements	1,961,634
Ceylon	1,076,752
Hong Kong	3,599,811
Mauritius	353,647
Cape of Good Hope and Natal	4,909,856
Possessions on the River Gambia, Sierra Leone	275,086
Possessions on the Gold Coast	483,045
Other Possessions	240,995
Total of British Possessions	71,092,163
Total of Foreign Countries and British Possessions	223,465,963

The Import Markets of the United Kingdom.—England's purchases from all foreign countries and British possessions reached last year the sum of 373,939,577*l.*, the highest value yet attained, and an increase of nearly four millions on the imports of the previous year; while since 1861 the increase has amounted to upwards of 156,000,000*l.*, an average increase of more than ten millions a year. We purchase most largely from the United States, our imports last year from the States reaching the enormous sum of 69,590,054*l.*, and even this showed a reduction of four millions on the previous year. From France our purchases amounted to 46,720,101*l.*, a slight increase on the previous year; and from Germany we bought to the value of 21,836,401*l.*, a rise of nearly two millions on the value of the imports of 1874. From Russia our imports decreased in value to 13,068,883*l.* in 1875, from 15,094,381*l.* in 1874; and from Sweden and Norway the imports also fell from 11,393,547*l.* to 8,918,638*l.* Our Dutch purchases showed a slight increase, the value in 1875 being 14,836,648*l.* against 14,464,158*l.* in 1874; and from Spain the value of our imports rose slightly from 8,641,639*l.* in 1874 to 8,660,953 in 1875. With Italy our dealings largely increased and reached a higher amount than in any of the previous fifteen years, the value of the goods bought in 1875 being 4,632,619*l.*, an increase of upwards of a million sterling on 1874, although but little above the value of the imports of the year 1871. Our purchases from Egypt amounted to 10,895,043*l.*, an increase upon 1874, but very much below the average of the fifteen years, and only half the value of our purchases in 1865, when they reached a sum of 21,773,250*l.* From Brazil we bought to the amount of 7,418,605*l.*; from Chili, 4,196,096*l.*; from Peru, 4,884,181*l.*; from China, 13,654,722, the highest amount in the fifteen years, and two and a half millions in excess of the value of the imports of 1874. From Central America we bought to the value of 1,308,889*l.*; and from the Argentine Republic 1,359,783*l.* Among the British possessions Australia and British India head the list of dealers with the United Kingdom, as they are also amongst the most extensive purchasers of its produce. Last year we bought from India to the value of 30,137,295*l.*, and from Australia to the amount of 20,559,154*l.* The Cape and Natal sent us produce worth 4,478,960*l.*, and from the Straits Settlements our purchases amounted to 3,149,310*l.*, as compared with 2,604,854*l.* in 1874. The West India Islands, with which our trade is still increasing, supplied us with goods to the value of 7,326,040*l.*, and Ceylon to the amount of 4,380,821.

Export Markets of the United Kingdom.—The total value of the British and Irish produce exported from the United Kingdom in 1875 was 223,465,963*l.*, the exports to foreign countries amounting to 152,373,800*l.*, and the exports to British possessions to 71,092,163*l.* This amount shows a striking decrease as compared with the value of the exports in 1872, which amounted to 256,257,347*l.*, the highest value reached in the last fifteen years; and it is noticeable that since that date the declared value of the British and Irish produce exported has decreased just as steadily as it had previously increased during a period of eleven years, the value having risen from 125,102,814*l.* in 1861 to 256,257,347*l.* in 1872. In nearly every case there was a decrease in the value of the exports of 1875 as compared with 1874,

but the most important reduction was in the case of the foreign countries, the exports to the British possessions showing a comparatively slight reduction. With Russia our trade had reached its highest point in 1874 as compared with the previous fourteen years, the declared value being 8,776,468*l.*, but in 1875 the value was 8,059,524*l.* Sweden and Norway were purchasers to the amount of 4,538,455*l.*, a reduction of nearly a million on the year 1874, when they bought to the value of 5,400,939*l.* Our trade with Germany, which had risen from 3,130,830*l.* in 1861 to 31,618,749*l.* in 1872, fell last year to 23,287,883*l.*, and France, which in 1871 bought to the amount of 18,205,856*l.*, the highest amount reached in the last fifteen years, only purchased to the value of 15,357,127*l.* in 1875. Spain and Portugal also show a decrease, but with Italy our trade increased, and last year the value of our imports to that country was 6,766,698*l.* against 6,369,609*l.* in 1874. Turkey bought far less than in 1874, its purchases in that year being 7,037,707*l.*, while last year they stood at 5,889,905*l.* The most noticeable decrease was, however, in the case of the United States, whose purchases were reduced by the large proportion of one-fourth, the value in 1875 being 21,868,279*l.* against 28,241,809*l.* in 1874. China, excluding Hong Kong, increased its dealings in British and Irish produce, buying to the extent of 4,928,500*l.* in 1875, and Japan almost doubled its purchases, the value of the exports to that country being 1,282,899*l.* in 1874 and 2,460,227 in 1875. In the record of the exports to British possessions there is a general though slight reduction, except in the case of the Australian Colonies, whose purchases rose from 19,062,920*l.* in 1874 to 19,491,241*l.* in 1875. British India also showed a slight increase, the value of the exports to that country having risen from 24,080,693*l.* in 1874 to 24,246,406*l.* in 1875. Hong Kong bought goods to the value of three and a half millions, and the Cape of Good Hope and Natal paid us in 1875 nearly five millions for our home produce. The North American Colonies bought to the value of a little more than nine millions. The value of our exports to our possessions abroad is now upwards of seventy millions, as compared with forty-two millions in 1861. The exports of foreign and colonial merchandise from the United Kingdom to foreign countries and British possessions reached a total value of 58,146,360*l.* last year, being a slight increase on the previous year, but below the value of 1871, which stood at 60,508,538*l.* Germany and France were our largest purchasers, the former buying to the value of 10,833,741*l.*, the latter to the value of 11,935,328*l.*; but both showed a large decrease on 1874. Among the British possessions the largest purchasers were Australia and British India, the former buying 1,733,379*l.*, and the latter 1,348,713*l.*

THE EXPORT TRADE OF THE UNITED KINGDOM.—The total value of the British, foreign and colonial produce exported from the United Kingdom during the year 1875, as stated in the Statistical Abstract recently published, shows a considerable reduction as compared with the previous year, the value in 1875 being 281,612,032*l.*, as compared with 297,650,464*l.* in 1874. There was a similar large reduction in 1874, as compared with 1873; in fact, since 1872, when the value stood at 314,588,834*l.*, there has been a constant falling off. The reduction has been chiefly under the head of British produce, the exports of foreign and colonial produce being slightly higher in value in 1875 than in 1874, whereas the value of British produce per head of the population was only 6*l.* 16*s.* 6*d.* last year against 7*l.* 7*s.* 9*d.* in 1874. While, however, there was a decrease in the total value there was a noticeable rise in many articles. The value of arms and ammunition, including small fire-arms, gunpowder, and all other kinds, was 2,050,384*l.* in 1875 against 1,782,767*l.* in the preceding year, and the increase in the value of the exports of these articles in the last fifteen years stands at the large sum of 929,458*l.*, or nearly 60,000*l.* a year. In unwrought leather the value rose from 1,319,363*l.* in 1874 to 1,495,831*l.* in 1875, and in wrought leather, including boots and shoes, from 1,374,302*l.* to 1,517,267*l.* There was a slight increase in the value of the exports of linen manufactures which stood at 7,272,970*l.* in 1875, compared with 7,116,302*l.* in the previous year. The growth of the export trade under this head has been very large in the fifteen years, amounting to an increase in value of 3,420,579*l.*, or an average increase of 228,000*l.* a year; but the value is now more than two millions less than in 1866, when it reached the high point of 9,576,245*l.* The exports of British spirits rose in 1875 to 274,697*l.* from 152,468*l.*, but the value had in that year fallen to a very low amount, and the amount last year was far below that of previous years, as in 1861 it was 484,704*l.* The returns on this head include only the spirits exported as merchandise, exclusive of ships' stores. In soap the value rose slightly from 277,723*l.* in 1874 to 310,511*l.* in 1875; and the exports of stationery, other than paper, increased from 686,056*l.* to 687,182*l.* Looking at the articles which contributed most largely to the decreased gross value of our exports, we find that in empty bags there was a fall from 1,750,002*l.* to 1,264,308*l.*; in beer and ale, from 2,449,035*l.* to 2,094,672*l.*, or a net decrease of 354,363*l.*; in butter, from 259,331*l.* to 240,281*l.*; in coal, cinders, and fuel, from 11,984,621*l.* to 9,658,088*l.*, or 2,326,533*l.*, while, as compared with the exports of 1873, those of last year showed a reduction in value of no less than 3,530,423*l.*; in wheat, from 230,066*l.* to 54,615*l.*, a reduction which is still more noticeable as compared with 1873, when the value was 759,605*l.*, while

fifteen years ago it stood at 996,948*l.*; in wheat flour, from 86,484*l.* to 19,992*l.*; in cotton manufactures, from 59,730,200*l.* to 58,598,853*l.*; in herrings, from 1,216,782*l.* to 956,620*l.*; in bottles, from 463,626*l.* to 366,319*l.*; in haberdashery and millinery, from 6,140,460*l.* to 4,922,420*l.*; in steam-engines, from 3,255,685*l.* to 2,631,333*l.*; in iron and steel, from 31,190,256*l.* to 25,747,271*l.*, a fall of 5,442,985*l.*, including a reduction of 624,352*l.* in the exports of steam-engines, and 4,184,400*l.* in railroads of all sorts; in silk manufactures, from 2,101,419*l.* to 1,734,519*l.*, a fall of 366,900*l.*; in woollen and worsted yarn, from 5,558,560*l.* to 5,099,307*l.*, and in woollen and worsted manufactures, from 22,800,952*l.* to 21,659,325*l.* The total value of the exports of British produce, of which these were the most important items, was 223,465,963*l.*, which, if compared with the value in 1861 (125,102,814*l.*), shows an increase of 98,363,149*l.*, the proportion per head of population being 6*l.* 16*s.* 6*d.* in 1875, and 4*l.* 6*s.* 5*d.* in 1861, giving an increase of 2*l.* 10*s.* 1*d.* per head in the fifteen years.

THE IMPORT TRADE OF THE UNITED KINGDOM.—The total value of the exports and imports of the year 1875, as shown by the Statistical Abstract of the United Kingdom recently published, was 665,551,900*l.*, or 20*l.* 0*s.* 4*d.* per head of the population. This sum shows a material reduction on the value of the previous year, when the proportion per head of population was 20*l.* 11*s.* 10*d.*, and it is also below the value of the years 1872 and 1873; but when compared with the other years, from 1861 referred to in the Abstract, it still shows a great increase, the proportion per head of population having been only 13*l.* 0*s.* 5*d.* in 1861, after which it gradually increased year by year until 1873, when it stood at 21*l.* 4*s.* 9*d.*, the highest point reached. The value of the imports only in 1875 showed an increase on 1874, as it amounted to 373,939,577*l.*, or 11*l.* 8*s.* 5*d.* per head, as compared with 370,082,701*l.*, or 11*l.* 8*s.* 3*d.* per head. The value of the imports has risen steadily since 1861, when it was only 217,485,024*l.*, or 7*l.* 10*s.* 2*d.* per head of population, although it has fluctuated at times. In 1870 it rose above three millions sterling, and is now gradually rising to four millions. Comparing the value of the imports in 1875 with 1874 there are some articles which show a remarkable increase. The imports of animals (oxen, bulls, cows, and calves) which had fallen in 1874 rose in value by a million and a half sterling, the value in 1875 being 4,885,462*l.*, as compared with 3,296,460*l.* in 1874; while there was a corresponding increase in the value of the sheep and lambs imported, the amount being 2,185,750*l.* against 1,610,355*l.* in 1874. Looking back to 1861 it appears that the value of the animals imported for food has trebled in the fifteen years. Still more remarkable is the growth in the value of the bacon and hams imported, the increase amounting to more than a million sterling in 1875 as compared with 1874; while in contrasting the year 1875 with 1861 it appears that the value has risen from 1,341,192*l.* to 6,982,470*l.* The value of the imports of butter, although below the year 1874, by nearly half a million still show an immense increase on previous years, the amount in 1875 being 8,502,084*l.*, as compared with 4,902,394*l.* in 1861. The imports of cheese show an increase from 4,483,927*l.* in 1874 to 4,709,508*l.* in 1875, and the latter sum is nearly three times the value of the imports in 1861, when it was only 1,636,799*l.* The imports of coffee which had slightly decreased in 1874 rose again in 1875, and amounted to 7,513,053*l.*, as compared with 7,064,788*l.* in the previous year; while looking back to 1861 when the value was 2,628,776*l.* the increase is nearly three fold. The imports of corn of every sort which had fallen in value in 1874 have again risen very considerably, and amounted to 53,086,691*l.*, an increase of two millions on 1874, and of eighteen millions when compared with the value of 1861. The value of the imports of raw cotton which has been decreasing steadily since 1866 fell again last year by more than four millions, the amount being 46,259,822*l.*, as compared with 50,696,496*l.* in 1874, and 78,219,401*l.* in 1864, a reduction of thirty-two millions in fourteen years. The imports of eggs have steadily risen since 1861, and last year amounted to 2,559,860*l.*, as compared with 2,433,134*l.* in 1874, and 550,557*l.* in 1861. The imports of fish are also steadily growing in value, having risen to 1,266,577*l.* in 1875 from 981,950*l.* in 1874, and 376,561*l.* in 1861. The value of the hides tanned and untanned reached 7,017,413*l.* in 1875, while in 1874 it stood at 6,831,432*l.*, and in 1861 at 2,899,663*l.* The imports of hops have doubled in value during the last fifteen years, having risen from 657,763*l.* in 1861 to 1,188,054*l.* last year. The demand for leather gloves has induced a great increase in that branch of foreign trade, the value of the imports being 2,430,876*l.* in 1875, as against 1,546,716*l.* in 1874, and 663,692*l.* in 1861, or nearly four fold that of fifteen years ago. The imports of all the metals, except silver ore, show a large increase in 1875 over 1874, and in the fifteen years have risen from about five to about thirteen millions sterling. The value of the imports of potatoes is steadily increasing, and has risen from 112,374*l.* in 1861 to 1,070,076*l.*, or in other words it has increased nine fold in fifteen years. The increasing use of esparto and other materials for paper-making is shown by the increase in the value of these imports from 7,293*l.* in 1861 to 1,230,823*l.* in 1875, while on the other hand the imports of rags for the same purpose have decreased in value from 338,713*l.* in 1861 to 273,851*l.* in 1875. The value of the imports of saltpetre has decreased considerably, but

the cubic nitre imported in 1875 was valued at 1,988,426*l.*, as compared with 334,162*l.* in 1861, or nearly six fold the value of fifteen years ago. The value of the imports of European silk manufactures is still rising very largely, and has increased from 5,729,445*l.* in 1861 to 12,018,332*l.* in 1875, the value having more than doubled in the fifteen years. The imports of spirits show a similar extensive growth, the value in 1875 being more than three millions sterling, as compared with 1,814,023*l.* in 1861. The value of the imports of refined sugar and sugar-candy was ten times that of 1861, having risen from 425,922*l.* to 4,338,166*l.*, and the imports of raw sugar have risen in the fifteen years from 12,163,308*l.* to 17,210,137*l.* The imports of tea have doubled in value in the same period, having risen from 6,850,562*l.* to 13,766,961*l.*, while in tobacco, cigars, and snuff the trade has grown from 277,479*l.* in 1861 to 1,191,607*l.* in 1875. The imports of wine have decreased considerably in the last two years, but the amount of 1875, 6,801,015*l.*, is still nearly double that of 1861, when the value was 3,862,233*l.* The imports of wool rose in value from 3,973,811*l.* in 1874 and from 9,717,686*l.* in 1861 to 4,308,357*l.* in 1875.

Ship Tonnage.—The annual statement of the tonnage of the vessels which entered, whether with cargoes or in ballast, from foreign countries and Brtiish possessions at ports in the United Kingdom shows the following results for the year 1875:—Of every 100,000 tons arriving the vessels coming from foreign countries constituted 85,347·46 tons, and vessels from British possessions 14,652·54 tons; the average of the preceding four years being 85,056 tons and 14,944 tons respectively. With regard to the nationality of the vessels thus arriving at ports in the United Kingdom, the returns show that in every 100,000 tons British vessels constituted 66,941 tons, and foreign vessels 33,059 tons, showing two-thirds British vessels and one-third foreign vessels. The average of the preceding four years shows 66,981 tons British and 33,019 tons foreign. The average gives the share of foreign vessels in every 100,000 tons as follows:—Arriving from foreign countries, 31,170 tons, and from British possessions, 1,849 tons. In 1875 the share of foreign vessels was 30,869 tons in arrivals from foreign countries, and 2,190 tons from British possessions. The following are the largest items in the list, showing the share of each nation in every 100,000 tons arriving at our ports in 1875:—From France came 14,977 tons; from the United States, 14,412 tons; from Germany, 9,869 tons; from Holland, 7,545 tons; from Belgium, 5,938 tons; from Russia, 7,522 tons; from Sweden, 4,578 tons; from Norway, 3,449 tons. The vessels arriving from British Possessions, 14,652 tons in 100,000, show 5,501 tons in 100,000 from British North America, 4,306 tons from the three Presidencies of British India, 1,158 tons from Australia, and 1,112 tons from the British West India Islands. All the preceding figures show ratios. The absolute tonnage of ships entering our ports in 1875 was 22,693,163 tons—namely, 19,368,037 tons from foreign countries and 3,325,126 tons from British Possessions; sailing vessels, 10,369,047 tons, and steam vessels, 12,324,116 tons; British vessels, 15,190,991 tons, and foreign, 7,502, 172. Repeated voyages, *i.e.*, repeated entries—are included and counted.

British Shipping.—The Registrar-General of Shipping and Seamen reports that the 20,191 registered sailing and steam vessels of the United Kingdom (exclusive of river steamers) actually employed in our home and foreign trade in 1875 were, in the aggregate, of 5,891,692 tons, which is 258,131 tons more then the tonnage of the 22,207 vessels actually employed in the trade of 1871. The increase in the five years was in vessels employed in our foreign trade, which in 1875 were of 4,593,360 tons, or 376,876 tons more than in 1871. The increase was also entirely in the larger ships employed. The total tonnage of all the vessels under 600 tons employed in 1875, whether in the home or or foreign trade, shows a decrease of 337,042 tons, as compared with 1871; the tonnage of vessels of 600 to 1,200 tons, an increase of 76,900 tons; the tonnage of vessels of 1,200 tons and upwards, an increase of 518,273 tons. The number of men and boys employed was 199,667 in 1875, or 71 fewer than in 1871. The increased employment of large vessels is strikingly shown in the following figures relating entirely to our trade with foreign parts. In that trade our ships of 1,200 and under 1,500 tons employed in 1871 were 511 of (in the whole) 673,084 tons, and in 1875 there were 630 of 836,551 tons; of ships of 1,500 and under 2,000 tons there were 164 of 276,874 tons in 1871, and 308 of 522,574 tons in 1875; of ships of 2,000 and under 2,500 tons, 45 of 100,399 tons in 1871, and 70 of 155,061 tons in 1875; of 2,500 and under 3,000 tons, 7 of 19,684 tons in 1871, and 27 of 73,637 tons in 1875; of 3,000 tons and above, 4 of 13,628 tons in 1871, and and 8 of 25,818 in 1875. Of this last class it is noteworthy that the 4 ships in 1871 employed only 318 men and boys, but the 8 in 1875 employed 930 men and boys.

3. TRADE AND AGRICULTURE.

COAL AND METALS OF THE UNITED KINGDOM.—The returns of the quantities and value of the coal and metals produced in the United Kingdom included in the Statistical Abstract bring the tables down to the end of 1874. In that year the quantity of coal raised was 125,043,257 tons, the value of which at the place of production was 45,849,194*l.*, or an average of 7*s.* 4*d.* per ton. The supply was nearly 2,000,000 tons less than in 1873, but it was 1,500,000 tons in excess of 1872, and largely above the preceding years. Compared with the previous fourteen years, the coal produced has risen from 83,635,214 tons in 1861 to 125,043,257 tons in 1874, giving an average increase of nearly 3,000,000 tons a-year; and the value at the place of production has risen from 20,908,803*l.* to 45,849,194*l.*, being at an average of nearly 2,000,000*l.* a-year. The value of a ton of coals at the pit in 1861 was a fraction under 5*s.* a ton. as compared with 7*s.* 3¾*d.* in 1874; showing an increase of 2*s.* 3¾*d.* in the fourteen years, or an average rise in value of about 2*d.* per ton every year. The quantity of pig iron raised in 1874 was 5,991,408 tons, as compared with 3,712,390 tons in 1861; the value in 1874 being 16,476,372*l.*, or 2*l.* 15*s.* per ton, and in 1861, 9,280,975*l.*, or 2*l.* 10*s.* per ton, thus showing an increased value of 5*s.* per ton in the fourteen years. The yield of fine copper from British ores has declined to a great extent. In 1861 the quantity produced was 15,331 tons, the value at the place of production being 1,572,480*l.*, while in 1874 the quantity was only 4,981 tons, valued at 447,891*l.* The value per ton in 1861 was 102*l.* 11*s.*, and in 1874 it was 89*l.* 18*s.*, a reduction of 12*l.* 13*s.* per ton. The quantity of metallic lead produced also shows a falling off from 65,634 tons in 1861 to 58,777 in 1874. The value in 1861 was 1,445,255*l.*, or 22*l.* 3*s.* per ton, and in 1874, 1,298,463*l.*, or 22*l.* 1*s.* per ton, a reduction of 2*s.* per ton. The quantity of white tin produced has considerably increased. In 1861 it was 7,450 tons, and in 1874 the yield was 9,942 tons, an increase of 2,492 tons. The value in 1861 was 910,762*l.*, or 122*l.* 4*s.* per ton; and in 1874 it was 1,077,712*l.*, or 108*l.* 7*s.* per ton, a decrease of 13*l.* 17*s.* per ton. The zinc produced in 1861 was 4,415 tons, and in 1874, after considerable fluctuations in the intervening years, it rose to 4,470 tons. The value in 1861 was 79,101*l.*, or 17*l.* 18*s.* per ton, and in 1874 it stood at 106,773*l.*, giving a value of 23*l.* 17*s.* per ton, an increase of 6*l.* per ton in the fourteen years. The silver produced from lead ore in 1861 was 569,530 oz., and in 1868 it rose as high as 835,542 oz., but in 1875 the produce was only 509,277 oz. The value in 1861 was 144,161*l.*, or 5*s.* an ounce, and in 1871 it was 127,319*l.*, a fraction of a farthing under 5*s.* an ounce. The value of the other metals has fallen from 250,500*l.* in 1861, to 5,450*l.* in 1874. The total value of the coal and metals shows an increase from 34,602,853*l.* in 1861, to 65,388,264*l.* in 1874, the increase being mainly due to the great rise in the produce and relative value of coal, which has even served to counterbalance the reduction under the head of British gold, the value of which in 1861 was 10,116*l.*; but in 1874 only 1,540*l.*, the quantity produced having fallen from 2,784 ounces in 1861, and 5,299 ounces in 1862, to 385 ounces in 1873.

The inspectors of mines report that in the year 1875 the produce of mines of the United Kingdom, classed under the Coal Mines Regulations Act, was as follows:—The coal produced amounted to 133,306,485 tons, an increase of 6,719,377 tons over the preceding year; fire-clay, 1,932,294 tons, a decrease of 135,597 tons; ironside, 12,018,594 tons, an increase of 325,408 tons; shale, &c., 442,940 tons, an increase of 80,193 tons; making a total of 147,700,313 tons, being more by 6,986,481 tons than in the preceding year. The number of mines at work was 169 more than in 1874. But the number of persons employed in and about the mines declined to 535,845, a decrease of 2,984. The number of lives lost by accidents in 1875—namely 1,244—shows an increase of 188.

CONSUMPTION OF TEA, COFFEE, AND COCOA.—The amount of duty received on tea in 1875 was 3,636,460*l.*, representing 145,457,749 lbs. entered for home consumption. In 1874 the quantity entered was 137,422,669 lbs., so that the gain was about eight million lbs., or 5·8 per cent., an advantage over the rate of increase, on a comparison of the receipts of the years 1873 and 1874, of about 1·7 per cent., and that on a total already swollen to an unprecedented extent. In coffee and chicory together there was a slight increase of 1,743 cwts. in favour of the year 1875. Taken separately chicory shows a falling off of 4,204 cwts., and coffee an advance of 5,947 cwts. The consumption varies but little from year to year, and instead of showing, like most of the articles subject to customs' duties, a progressive rate of increase, it is intermittent in its character, and on a comparison at long periods exhibits a slightly retrograde tendency. The stock of coffee in bond, both raw and roasted, at the end of 1875 was 354,333 cwts. The consumption of cocoa, on the contrary, increases rapidly. In 1874 there was an increase of 6·6 per cent. over the quantity consumed in the previous year, and in 1875 there was an increase of 12·5 per cent. upon the figures then quoted. In 1868 the consumption was but little over five million lbs.; in 1875 it was close upon ten millions, having doubled itself in the space of eight years.

AGRICULTURE OF THE UNITED KINGDOM.—The following Return shows the Acreage under each Crop, and Fallow, and Grass, and Number of Live Stock, in Great Britain and Ireland upon 25th of June in 1867, 1870, 1873, and 1875:—

DESCRIPTION of CROPS and LIVE STOCK.	UNITED KINGDOM, including the Isle of Man and Channel Islands.			
	1867.	1870.	1873.	1875.
CORN CROPS.	Acres.	Acres.	Acres.	Acres.
Wheat	3,367,876	3,500,543	3,490,380	3,342,481
Barley or Bere	2,259,164	2,371,739	2,335,913	2,509,701
Oats	2,750,487	2,763,300	4,676,227	2,664,009
Rye	52,865	65,166	51,634	54,903
Beans	536,298	530,095	586,561	564,181
Peas	318,090	317,198	318,213	316,375
Total	9,284,780	9,548,041	9,458,928	9,451,650
GREEN CROPS.				
Potatoes	492,217	587,661	514,682	522,653
Turnips and Swedes	2,173,850	2,210,911	2,121,908	2,142,698
Mangold	258,126	306,531	325,702	361,617
Carrots	15,923	15,259	15,503	14,936
Cabbage, Kohl-Rabi, and Rape	133,692	143,930	174,762	189,733
Vetches, Lucerne, and any other Crop (except Clover or Grass)	424,355	322,438	423,929	432,470
Total	3,498,163	3,586,730	3,576,486	3,664,107
OTHER CROPS, GRASS, &c.				
Flax	—	23,957	14,683	6,751
Hops	64,284	60,594	63,278	69,171
Bare Fallow or Uncropped Arable Land	922,558	610,517	706,498	557,979
Clover Sanfoin, and Grasses under Rotation — For Hay	—	2,069,233	2,138,533	2,108,980
Clover Sanfoin, and Grasses under Rotation — Not for Hay	—	2,435,651	2,228,285	2,245,091
Total	3,989,974	4,504,884	4,366,818	4,354,071
Permanent Pasture (exclusive of Heath or Mountain Land) — For Hay	Not ascertained.	3,067,151	3,414,969	3,610,706
Permanent Pasture (exclusive of Heath or Mountain Land) — Not for Hay	Not ascertained.	9,005,705	9,500,960	9,701,915
Total	11,136,036	12,072,856	12,915,929	13,312,621
ORCHARDS: Arable or Grass Land used also for Fruit Trees	Not ascertained.		148,221	154,584
MARKET GARDENS	Not ascertained.		37,884	38,957
NURSERY GARDENS: for growing Trees, Shrubs, &c.	Not ascertained.		11,370	12,042
WOODS, Coppices, and Plantations	Not ascertained.		2,187,078	2,187,078
LIVE STOCK.	No.	No.	No.	No.
Horses: used solely for Agriculture, Mares kept solely for breeding, and unbroken Horses	—	1,266,709	1,276,444	1,340,120
Other kinds (subject to Licence Duty in Great Britain)	—	823,266	915,000	915,000
Cattle	4,993,034	5,403,317	5,964,549	6,012,824
Sheep	28,919,101	28,397,589	29,427,635	29,167,438
Pigs, exclusive of those kept in Towns and by Cottagers	2,966,979	2,171,138	2,500,259	2,229,918

LANDOWNERS OF ENGLAND AND WALES.—It appears from the analysis of the Landowners' Return, obtained on the motion of Mr. Bright, that two-thirds of the land of England and Wales are in possession of rather more than 10,000 owners. Taking from the scale below all owners having 500 acres or more, their aggregate number is 10,207, and they together possess 22,013,203 acres, or two-thirds of the 33,013,514 acres of the return. The accumulation in Scotland is still more remarkable. Selecting owners in the same portion of the scale, we find 2,584 proprietors, holding 18,167,569 out of a total 18,946,694 acres. The territorial aristocracy having this immense domain, the smaller owners, numbering in all 129,547, are left about 780,000 acres between them all. Stating the facts for Great Britain, we have these results:—Of the 1,104,967 owners, large and small, having in all 51,960,208 acres, 12,791 owners of 500 acres and upwards hold 40,180,000 acres, or four-fifths of the whole very nearly.

The Number and the Extent of the Possessions of the Landowners of Great Britain (including London).

Owners.	England and Wales, exclusive of the Metropolis. Number.	Extent of Lands.	All Scotland. Number.	Extent of Lands.
		Acres.		Acres.
Of less than 1 acre	703,289	151,171	113,005	28,177
„ 1 acre and under 10 acres	121,983	478,679	9,471	29,327
„ 10 acres „ 50 „	72,640	1,750,079	3,469	77,619
„ 50 „ „ 100 „	25,839	1,791,605	1,213	86,483
„ 100 „ „ 500 „	32,317	6,827,346	2,367	556,372
„ 500 „ „ 1,000 „	4,799	3,317,678	826	582,741
„ 1,000 „ „ 2,000 „	2,719	3,799,307	591	835,242
„ 2,000 „ „ 5,000 „	1,815	5,529,190	587	1,843,378
„ 5,000 „ „ 10,000 „	581	3,974,724	250	1,726,869
„ 10,000 „ „ 20,000 „	223	3,098,674	159	2,150,111
„ 20,000 „ „ 50,000 „	66	1,917,076	103	3,071,728
„ 50,000 „ „ 100,000 „	3	194,938	44	3,025,616
„ 100,000 „ and upwards	1	181,616	24	4,931,884
No areas	6,448	—	11	—
No rentals	113	1,423	11	1,147
Total	972,836	33,013,514	132,131	18,946,694

The statistics it may be mentioned are tabulated to scale for every county in the kingdom.

WINE.—The consumption of wine of all kinds in 1875 remained practically in the same position it occupied in 1874, there being a difference of 65,252 gallons only in favour of the year 1875. Sherry has fallen off in consumption by 158,269 gallons, representing a loss in duty of 19,717*l.*, but this was almost exactly counterbalanced by a corresponding increase in the consumption of Portuguese wine, which appears to advance steadily amid all the fluctuations to which the wines of other countries are subject, there being an average annual increase of about 5 per cent. per annum, and an increase, taking the two most remote points of comparison, the years 1871 and 1875, of no less than 21 per cent. Red and white wines from France showed no noteworthy features of divergence, the quantities, 3,502,516 gallons of red and 1,536,599 gallons of white, being practically the same as those recorded in the year 1874. The total quantity of wine of all kinds cleared for consumption in 1875 was 17,349,494 gallons, of which 8,683,802 were red, and 8,665,692 white.

WHEAT.—The value of the wheat and wheat meal imported into the United Kingdom in 1875 was 32,380,726*l.*, grown in the kingdom in the same year is estimated at 21,823,950*l.*, from which it follows that the quantity grown at home was much less than half of what was required for the consumption of the people. The deficiency, however, was supplied from abroad with such facility that the price, since the fall after the harvest of 1874, was not materially affected or raised by the comparative deficiency in 1875. The official average price immediately after the harvest of 1874 was 46*s.* 1*d.*, and after that of 1875 only only 46*s.* At the close of those years it was 44*s.* 8*d.* and 45*s.* 9*d.* respectively. During the intermediate periods it had shown little fluctuation, and was at June, 1876, 46*s.* 4*d.*

IRISH LANDHOLDERS.—The Agricultural Statistics of Ireland, issued from the General Register Office, show that the number of separate holdings of land in that country in 1875 was 585,483, being 204 less than in the preceding year. The returns show 51,459 holdings not exceeding an acre in extent, an increase of 1,193 over the number in the preceding year. There were 69,098 holdings above one and not exceeding five acres, a decrease of 927 as compared with 1874, and a decrease of no less than 241,338, or 77·7 per cent., as compared with the number in 1841. The farms above five and not exceeding fifteen acres were 166,959 in 1875, a number which is less by 491 than in 1874, and is only equal to two-thirds of the number in 1841. On the other hand, to set against these large decreases, the farms above fifteen and not exceeding thirty acres, 137,669 in number in 1875, though they were 287 fewer than in 1874, were more than in 1841 by no less than 73·5 per cent. The farms above thirty acres were 160,298 in 1875, showing an increase of 309 over 1874, and of 111,673, or 229·7 per cent. over 1841. Of these larger holdings there were in 1875 as many as 73,045 between 30 and 50 acres, 55,618 between 50 and 100, 21,909 between 100 and 200, 8,197 between 200 and 500, and 1,529 above 500 acres. The total number of holdings in Ireland above one acre were 691,202 in 1841, but only 534,024 in 1875—a decrease of 22·7 per cent.; and of these there were, in 1841, 642,577 not exceeding 30 acres, and only 48,625 over that acreage; but, in 1875, there were only 373,726 not exceeding 30 acres, and 160,298 above 30 acres. But many landholders occupy more than one farm, and therefore it is the practice to make another return of the number of "occupiers," and the whole extent of their holdings, whether lying together or in different localities; and in this return, which is described as only approximate, the 585,483 separate holdings are shown to be in the hands of 533,825 occupiers—a number which is 481 more than in 1874, but 8,013 fewer than in 1872. These 533,825 occupiers comprise 385,728 holdings not more than 30 acres each, and 148,097 holding above 30 acres. Deducting 50,322 occupiers holding not more than one acre, we find 483,503 occupiers holding above an acre of land, of whom 62,104 hold not more than five acres, and 273,302 hold from five to thirty acres, the remaining 148,097 holding more than thirty acres. Of this last number, 65,722 occupiers hold from 30 to 50 acres, 50,569 from 50 to 100, 20,696 from 100 to 200, 8,697 from 200 to 500, and 2,413 hold above 500 acres. The number of improved agricultural machines in Ireland, having for their object the saving of manual labour, increased from 28,100 in 1865 to 58,881 in 1875. The majority in both years were worked by horse power; but in 1875 the number worked by steam had risen to 566, and 602 were worked by water power.

TOBACCO.—Tobacco still continues to maintain the first position in our revenue accounts, the receipt for the year on all kinds of this article, manufactured and unmanufactured, having been 7,720,557*l.*, or more than one-third of the total Customs revenue from atl sources. The quantity of unmanufactured tobacco cleared for consumption in 1875 was 47,026,902 lbs., an increase of 1,188,913 lbs., or 2·6 per cent. over the quantity consumed in 1874; and as regards the manufactured tobacco, the increase was 50,756 lbs., or 3·9 per cent., giving in the aggregate an increase of 2·6 per cent. ovor the quantities of all kinds cleared in 1874. Although this is but a small percentage of improvement, it is represented in money, in consequence of the high duty to which the article is subject, by the sum of 198,330*l.* Of the 47,026,902 lbs. of leaf tobacco entered for consumption, 21,104,586 lbs. consisted of stemmed or stripped, and 25,922,316 lbs. of unstemmed.

CORN CROPS.—The agricultural returns for Great Britain show that the acreage under wheat in 1876 was 2,994,957 acres, which is a less quantity than in 1875 by 347,524 acres; under barley or bere, 2,533,109 acres, an increase of 23,408 acres over last year; under oats, 2,789,530 acres, an increase of 125,521 acres; under rye, 56,210 acres, an increase of 1,307 acres; under beans, 517,556 acres, a decrease of 46,625 acres; under peas, 293,407, a decrease of 22,968 acres. The total area under corn crops in Great Britain was, therefore, 9,184,769 acres, being 266,881 acres less than in 1875. The large decrease in the area under wheat more than counterbalances the increase in some other crops. The decrease in the acreage under wheat extends to almost every county, the only exception worth mention being Cambridgeshire, in which the acreage rose to 125,597 acres, or 1,839 acres more than in last year. Only six other counties in Great Britain had as many as 100,000 acres under wheat this year. These were Lincoln, with 274,284 acres, being 21,245 acres less than in 1875; Norfolk, with 186,526 acres, a decrease of 12,182 acres; Essex, with 168,653 acres, a decrease of 16,873 acres; Suffolk, with 141,292 acres, a decrease of 5,909 acres; Devon, with 112,652 acres, a decrease of 11,268 acres; and Hampshire, with 104,707 acres, a decrease of 3,655 acres. Last year Kent and the East Riding of Yorkshire had also above 100,000 acres under wheat. In the present year England had 2,822,342 acres under wheat, a decrease of 306,205 acres; Wales, 94,423 acres, a decrease of 17,374 acres; Scotland, 78,192 acres, a decrease of 23,945 acres. Adding the 9,788 acres under wheat this year in the Isle of Man and Channel Islands, and 119,597 acres in Ireland (this last number showing a decrease of 39,398 acres), we find that the total acreage under wheat in the United Kingdom in 1876 was 3,124,342 acres, which is less by 387,420 acres than in 1875, a decrease of more than 11 per cent.

4. POPULATION, PUBLIC EMPLOYMENT, AND VITAL STATISTICS.

HEALTH OF LARGE TOWNS IN 1875.—The Registrar-General, in his annual summary of mortality, gives the following facts respecting eighteen great English cities or towns:—Excluding London, the estimated population was 3,236,873. The mortality of some of the cities is decreasing, and among them may be named Liverpool, Manchester, Sheffield, Sunderland, and Newcastle-upon-Tyne. Bristol, Birmingham, Nottingham, Salford, Oldham, Bradford, and Hull experienced higher rates of mortality in 1874 than in 1871. The salubrity fluctuates from year to year, but in the year 1875 the towns, including London, stood in the following order:—Portsmouth 19·5, Sunderland 22·4, London 23·7, Norwich 24·5, Wolverhampton 24·7, Sheffield 24·8, Newcastle-upon-Tyne 26·1, Leeds 26·4, Birmingham 26·5. Leicester 26·5, Bristol 26·8, Bradford 27·1, Hull 27·4, Liverpool 27·5, Nottingham 27·7, Oldham 29·6, Manchester 29·9, and the borough of Salford 31·5. Fifty other large town districts, with an estimated population of 2,724,784, offer some interesting facts. In this year the mortality was at the rates below 20 per 1,000 in Dover (16·4), Chatham, Maidstone, Hastings, Reading (18·7), Colchester, Devonport (18·5), and Cheltenham (18·8). The mortality exceeded 26 in Exeter, Stockport (31·6), Wigan (30·3), Bolton, Bury, Ashton-under-Lyne (33·2), Preston (31·8), Gateshead, and Carlisle.

LUNACY IN SCOTLAND.—The Eighteenth Annual Report of the Lunacy Commissioners for Scotland shows that the total number of lunatics in Scotland, of whom the Commissioners had official cognizance, on January 1st, 1875, was 8,225, of whom 3,850 were males and 4,375 females. Of these, 5,002 were in Royal and district asylums, 226 in private asylums, 1,472 in private dwellings, and the remainder in parochial asylums and poorhouses, with the exception of 49 in the lunatic department of Perth General Prison, and 143 in training schools; 6,700 of them are maintained by parochial rates, 49 by the State, and the remainder from private sources. Of the unreported insane, maintained by their friends in private dwellings, the Commissioners have no certain knowledge. The number of registered lunatics when the Commissioners first entered on their functions, namely, in January, 1858, was 5,823, so that there is shown in the 17 years an increase in lunatics of 2,402; but this increase may in part be due to more lunatics in proportion to the total number having come under official cognizance. In 1858, the number of lunatics per 100,000 of population was 191; in 1875 it was 230, there having been a gradual increase in the proportion during the intervening years. This proportion of lunatics to population is the lowest in the county of Renfrew, where, in 1875, the figure was as low as 126 per 100,000; and the highest in Kinross, with 375 lunatics per 100,000 of the population. The total number admitted to asylums during the year 1875 was 2,191, being 490 private and 1,701 paupers. During the same period, 974 were discharged recovered; 397 removed, not recovered; and 561 died, the total number removed being thus 1,932, of whom 461 were private and 1,471 paupers. The highest rate of recovery is found in parochial asylums. This, the Commissioners say, is probably explained by the fact that the patients received into these institutions comprise a greater proportion of persons labouring under the ephemeral forms of insanity than those received into public and private asylums. Of the unrecovered patients removed, 21 escaped. The total number of escapes during the year was 257, of whom 161 were brought back within 24 hours, 60 within a week, and 15 after a week. There were six cases of suicide. The total expenditure for pauper lunatics in Scotland was, for the year ending May 14, 1875, 157,806*l.*, being nearly double the amount expended in 1858. The amount paid from Imperial sources towards the support of these lunatics was 59,483*l.*, so that the direct durden on the payers of parochial rates was 98,328*l.*

BIRTHS, DEATHS, AND MARRIAGES IN IRELAND.—The Registrar-General for Ireland has just issued his annual return of the numbers of births, deaths, and marriages *registered* in that part of the kingdom for 1875. The word "registered" is italicized by the Registrar, doubtless for the purpose of directing the reader's notice to the circumstance, which will be exemplified presently, that the births, deaths, and marriages stated are short of the real numbers. The ratios in Ireland persistently fall below the ratios obtained in England and Scotland. The Irish and the English ratios are compared in the three tables below. Ireland during the years under review has had a decreasing population, England an increasing one. During the last ten years the Irish population has decreased about 290,000 souls; the English has increased about 2,500,000. The estimated population of Ireland in 1875 was 5,310,000; the births numbered 138,382, 71,096 boys and 67,286 girls) or 26·1 per 1,000 of population. The deaths numbered 98,243 (49,068 males and 49,175 females), or 18·5 per 1,000; and the marriages were 24,259, or 4·57 per 1,000 of estimated population. The Registration Act came into operation in 1845, but was then limited to births and deaths. Twenty

years afterwards Acts for the registration of Roman Catholic and Protestant marriages were passed. Commencing, therefore, with the year 1865, we have, or ought to have, a full record. The figures for England, which are compared with those for Ireland, are taken from the last annual report of the Registrar-General for England. The average of estimated population of Ireland in the decade 1865–1874 was 5,436,000. The ratio of births in Ireland and in England is compared in the table:—

	Number of Births registered in Ireland.	Ratio per 1,000 of Population.	Ratio of Births in England.	Excess of Births in England per 1,000 of Population.
1865	144,970	25·9	35·4	9·15
1866	146,090	26·5	35·2	8·17
1867	144,388	26·3	35·4	9·10
1868	146,051	26·7	35·8	9·10
1869	145,659	26·7	34·8	8·10
1870	149,846	27·7	35·2	7·50
1871	151,355	28·1	35·0	6·90
1872	149,278	27·3	35·8	8·00
1873	144,377	27·1	35·5	8·40
1874	141,411	26·6	—	—

Here it is found that the English ratio of births exceeds the Irish 6·90 being the lowest excess, and 9·15 the highest. The comparative ratio of deaths is given in the next table:—

	Number of Deaths registered in Ireland.	Ratio per 1,000 of Population.	Ratio of Deaths in England.	Excess of Deaths in England per 1,000 of Population.
1865	93,154	16·7	23·2	6·5
1866	93,027	16·8	23·4	6·6
1867	93,503	17·0	21·7	4·7
1868	86,185	15·8	21·9	6·1
1869	89,593	16·4	22·3	5·9
1870	90,462	16·7	22·9	6·2
1871	88,348	16·4	22·6	6·2
1872	97,294	18·1	21·3	3·2
1873	97,537	18·3	21·1	2·8
1874	92,352	17·4	—	—

The difference as against Ireland is not so large here, and during the latest years for which the comparison can be made the Irish and English figures appear to be approximating. The highest excess was 6·6 per 1,000 that occurred in the year 1866; by 1873 the excess of English deaths was only 2·8. The proportion of marriages is compared hereunder:

	Number of Marriages registered in Ireland.	Ratio per 1,000 of Population.	Ratio of Marriages in England.	Excess of Marriages in England per 1,000 of Population.
1865	30,802	5·51	8·75	3·24
1866	30,121	5·45	8·75	3·30
1867	29,742	5·42	8·25	2·83
1868	27,699	5·07	8·05	2·98
1869	27,277	5·01	8·95	3·94
1870	28,677	5·29	8·05	2·76
1871	28,960	5·37	8·35	2·98
1872	26,943	5·02	8·75	3·73
1873	25,730	4·82	8·80	3·98
1874	25,201	4·74	—	—

It will be observed that the English ratios of the last table do not exceed the Irish ratios by figures so absolutely large as in the case of the births and deaths. The

smallest excess in marriage ratio of England was 2·76 per 1,000, the highest 3·98 per 1,000 souls. The average excess of the English ratios in these tables indicate that the births in Ireland are the worst recorded and the marriages the best, the deaths occupying an intermediate position on the scale of completeness.

REGISTERED NURSING HOUSES.—Under the Infant Life Protection Act of 1872, no person is to receive for hire more than one child under a year old, for the purpose of nursing apart from its parents, except in a house registered by the local authority, the applicant being a person of good character; the registration to remain in force for a year only. The Metropolitan Board of Works, the local authority for the metropolis, report that during the year 1875 in their whole district the total number of houses registered was only five, and they were only authorised to receive eleven infants. The superintending architect observes in his report that until this Act shall be amended, it seems impracticable to obtain any satisfactory observance of its provisions regarding registration of nurses.

CENSUS OF YOUNG MEN.—A Parliamentary return, ordered on the motion of Mr. Henley, states that it is estimated that, in the middle of the year 1851, the population of the United Kingdom comprised 2,049,541 young men aged 18 and under 26, and that, in 1871, the number was 2,201,927, an increase of less than 7·5 per cent. in the 20 years. In England and Wales the number in 1871 (including army, navy, and merchant seamen abroad as well as at home) was 1,616,226, showing an increase of more than 21·5 per cent. since 1871; in Scotland the number in 1871 (not including persons abroad) was 227,340, an increase of not quite 7 per cent.; but in Ireland the number in 1871, namely, 358,361 (not including persons abroad) showed a decrease of more than 29 per cent. Emigration takes away a larger share of young men than of other classes of the population.

MORTALITY IN THE METROPOLIS.—The mortality in the various districts of London differs widely; it ranges from 16 per 1,000 in Hampstead, 19 in St. George, Hanover Square, 19 in Lewisham, and 19 in Wandsworth, to 27 in Westminster and Bethnal Green, to 28 in Holborn and Stepney, 29 in St. Giles, and 30 in Whitechapel and St. George's in the East. All the latter districts contain "rookeries." Lewisham affords a striking instance of the effect of increased density of population. The mortality was at the rate of 17 per 1,000 in 1841-50; it rose to 18 in the next decade, and to 19 in the last. The density increased during the three terms, and in the last was tripled.

BIRTHS, MARRIAGES, AND DEATHS.—The following table shows the total number of births, deaths, and marriages in England and Wales, and Scotland, from 1859 to 1875, and Ireland, from 1865 to 1875:—

ENGLAND AND WALES.

Years.	Births.	Deaths.	Marriages.
1859	689,881	441,790	167,723
1860	684,048	422,721	170,156
1861	696,406	435,114	163,706
1862	712,684	436,573	163,830
1863	727,417	473,837	173,510
1864	740,275	495,531	180,387
1865	748,069	490,909	185,474
1866	753,870	500,689	187,776
1867	768,349	471,073	179,154
1868	786,858	480,622	176,962
1869	773,381	494,828	176,970
1870	792,787	515,329	181,655
1871	797,428	514,879	190,112
1872	825,907	492,265	202,267
1873	831,809	494,003	205,460
1874	854,307	526,701	201,605
1875	850,187	546,317	200,980

SCOTLAND.

1859	106,543	61,714	21,201
1860	105,629	68,170	21,225
1861	107,036	62,287	20,828
1862	107,138	67,159	20,544
1863	109,325	71,421	22,087
1864	112,445	74,303	22,675
1865	113,126	70,821	23,577
1866	113,639	71,273	23,629
1867	114,115	69,024	22,521
1868	115,673	69,386	21,853
1869	113,395	75,789	22,083
1870	115,423	74,067	23,788
1871	116,127	74,644	23,966
1872	118,873	75,741	25,580
1873	119,738	76,857	26,730
1874	123,795	80,676	26,247
1875	123,693	81,785	25,921

IRELAND.*

1865	144,970	93,154	30,802
1866	146,237	93,598	30,151
1867	144,318	93,911	29,796
1868	146,108	86,803	27,753
1869	145,659	89,573	27,277
1870	150,151	90,695	28,835
1871	151,665	88,720	28,960
1872	149,292	97,577	27,114
1873	144,592	97,840	26,566
1874	144,411	92,352	25,201
1875	138,382	98,243	24,259

* Owing to the defective state of the Registration, the figures for births, deaths, and marriages in Ireland are only an approximation to the real numbers.

RAILWAY TRAVELLING.—The number of railway travellers in the United Kingdom is not known, because the number of journies made by periodical ticket-holders (the number of times they are railway passengers) is unknown. What is shown, for instance, for the year 1875, is that there were 506,975,234 ordinary passengers, that they paid more than 21½ million pounds for their fares, and that there were also 597,257 holders of season or periodical tickets, and these paid 1,151,248*l.* for their tickets, averaging 38*s.* 6*d.* each. Almost all the companies have, however, voluntarily supplied to the Board of Trade a further return, showing how much of this last sum came from each class of travellers; and from this we learn that, in 1875, as much as 652,232*l.* was received for first-class periodical tickets, 367,111*l.* for second-class, and 81,535*l.* for third-class, this last item including workmen's weekly tickets. In 1875, therefore, less than 8 per cent. of the receipts from periodical ticket-holders came from third-class passengers—the class from which comes much more than half the receipts from ordinary passengers. On the Metropolitan Railway the periodical tickets produced 26,581*l.* in 1875, but only 271*l.* of it was from third-class passengers. On the North London line, 2,405*l.* of the whole 28,470*l.* received for periodical tickets came from third-class passengers; on the Great Eastern, 4,491*l.* of the whole 74,949*l.*; on the Great Western, 244*l.* of the whole 48,478*l.*; on the North Western, 1,445*l.* of the whole 91,034*l.*; on the South Western, 2,705*l.* of the whole 103,660*l.*; on the Chatham, 3,044*l.* of the 58,675*l.*; on the South Eastern, 8,279*l.* of the 124,108*l.*; on the Midland, 16,017*l.* of the 56,602*l.*; but the Midland has no second-class. The North Eastern Railway shows for third-class as much as 12,749*l.* of its total 51,724*l.* received from periodical tickets in 1875. The largest revenue from periodical tickets in the year was on the London and Brighton line, which received 76,332*l.* from first-class passengers holding periodical tickets, 47,362*l.* from second-class, but only 448*l.* from the third-class.

GROWTH OF THE METROPOLIS.—A return issued by the Metropolitan Board of Works shows the annual rateable value of property within the jurisdiction of the board, in April, 1876, as compared with the corresponding month of 1856 (the second year of the board's existence). According to this return, the total acreage of the parishes coming within the Metropolis Local Management Act of 1855 is 75,490. In 1856, the annual rateable value of this property was 11,283,663*l.*, and in 1876 it had increased to 23,111,313, showing an increase of 104·7 per cent. in the 20 years. On looking over the figures it will be found that this addition is spread over the whole of the rateable property of London—in a few instances only is there any decrease of value, and these are specified in the return. The principal falling off is in the Middle Temple, which shows a decline in value of 2,083*l.* Furnival's Inn has also fallen off to an extent of 355*l.*, and Tooting Graveney and St. Botolph, Aldgate, 632*l.* and 629*l.* respectively. On a comparison of values it will be found that, with the exception of the Charterhouse, which is 444 per cent., the parish of St. Mary Abbott, Kensington, has increased in value with the greatest rapidity. In 1856 its annual rateable value was only 242,284*l.*, whilst in 1876 it was 1,270,355*l.*, or an increase of 424 per cent. One-fifth of this increase is due to the last two years, during which the value has gone up to the extent of 210,246*l.* Next to Kensington, the hamlet of Penge shows the largest increase, property in this district having increased 338 per cent. Stratford-le-Bow follows with an advance of 338 per cent.; St. John, Hampstead, next, with 323 per cent.; St. Mary, Battersea, 319 per cent.; St. Leonard, Bromley, 301 per cent.; Stoke Newington, 243 per cent.; Hammersmith, 239 per cent.; Bethnal Green, 203 per cent.; Southwark, 198 per cent.; Bermondsey, 171 per cent.; Rotherhithe, 168 per cent.; Islington, Putney, and Camberwell, 164 per cent.; Plumstead, 152 per cent.; Paddington, 150 per cent.; Deptford, 148 per cent.; Eltham, 147 per cent.; next to which comes the city of London, with an increase in rateable value from 1,203,466*l.* to 2,968,086*l.* or an increase of 146 per cent. Lambeth also shows a respectable increase. The parish of Kidbrooke, in Plumstead, shows the lowest rate of increase, viz., 1 per cent.; ard the liberty of Charterhouse the highest, viz., 444 per cent., a result doubtless due to the recent sale of the ground for building purposes within the last two years.

AGES AT DEATH FROM PARTICULAR DISEASES.—The following table shows the mean age at death from certain causes from 1848 to 1872, and the annual deaths to every million living from those causes by the English life table, compared with the mortality as deduced from a comparison of the population with the deaths registered from the same causes from 1851 to 1870:—

Cause of Death.	Mean Age at Death, 1848-72	Annual Deaths to 1,000,000 living of all ages.	
		Life Table.	Registered Deaths.
Whooping Cough	1·8	371	521
Measles	2·7	315	437
Scarlatina and Diphtheria ..	5·8	856	1,046
Small Pox ..	11·9	160	204
Typhus	26·	933	918
Childbirth and Metria.. ..	31·7	169	168

5. CRIME, PAUPERISM, AND ACCIDENTS.

POLICE STATISTICS OF THE METROPOLIS.—From the report of the Commissioner of Police for the year 1875 it appears that the total authorised strength of the metropolitan police on the 31st December last was 10,227. Of these 674 were employed at the royal dockyards and military stations, 562 in various public departments, railways, and different institutions, their services being paid for to the Receiver of Police, and 8,991 in the police service of the metropolis proper. The police force, as constituted on that day, comprised 25 superintendents, 277 inspectors, 1,050 sergeants, and 8,875 constables. The total area of the metropolitan police district is 688·31 miles apportioned into 21 divisions, including the Thames, which is confined strictly to the portion of the river from Walton-on-Thames to Erith, within the jurisdiction of the Commissioner of Police. The town continues to grow much as in former years. During 1875 there were 10,023 new houses built: 169 new streets, and 4 new squares were opened and handed over to police protection, covering a length of 29 miles 1,475 yards; and 3,775 new houses were in course of erection. The number of new houses show an increase of 25 per cent. over the number built in 1874. The peace of the metropolis was not disturbed in any serious manner during the year. The total number of persons apprehended by the police during the year was 72,606, of whom 49,712 were summarily convicted, and 2,343 convicted after trial. There is an increase in the total arrests of 4,903 over the arrests in 1874. This large increase is almost wholly accounted for by the increased drunkenness among the population. The charges of "drunk and disorderly" increased from 12,099 in 1874 to 14,926 in 1875, and for simple drunkenness, which may be taken as "drunk and incapable," from 14,056 in 1874 to 16,050 in 1875; the total increase under these two offences being 4,821, leaving the increase in all the other offences put together at 182, with a rapidly increasing population. The more serious indictable offences—burglary, robbery, larceny, receiving stolen goods, &c., show still a decrease on the number recorded in 1874, which was marked as the year having the smallest number of serious crimes in this decade. The decrease is from 10,185 in 1874 to 9,943 in 1875, combined with the fact that the apprehensions were more numerous in 1875, and the convictions only 11 less. In 1868, the number of these crimes was 14,316, showing a reduction in 1875 of 4,373 serious offences, being 30·54 per cent. Burglaries decreased from 349 in 1874 to 318 in 1875, and simple larceny from 6,674 to 6,444, being the smallest numbers recorded since these police statistics were compiled, from 1866. The only offence which shows any marked increase is "attempts to rob," which increased from 6 to 21, but in every case apprehensions were made, and 14 convictions were obtained. The total number of indictable offences committed was 12,228, a decrease of 357 as compared with the previous year, while the apprehensions increased from 3,921 to 4,018, and the convictions from 2,306 to 2,343. 11,775 summonses were taken out by the police during the year, 1,058 of which were dismissed, and 10,717 resulted in convictions. The increase over the previous year, when the number applied for was 10,604, is chiefly due to the increased number taken out against stage carriages, hackney carriages, carts and waggons, and licensed premises. 87 persons were killed in the streets, and 2,704 were maimed or injured. The number of persons killed is considerably less than in the last six years, during which the average has been 123, but the injuries show an increase of 136 over 1874.

JUDICIAL STATISTICS OF SCOTLAND.—From the eighth report on the judicial statistics of Scotland, it appears that during the year 1875 142,973 persons were charged by the police, 30,838 in the several counties, and 112,135 in the burghs. The total number shows a very favourable contrast to 1874, when 154,820 persons were charged, and in 1873, when the number was 155,302. The average yearly total during the quinquennial period ended 1875 was 148,929. The figure 142,973 is made up of 9,554 offences against the person, 15,691 offences against property, and 117,728 miscellaneous charges. Offences against the person have increased in number during the five years given, and in 1875, in spite of the general decrease in the number of charges, they were 600 above the average. In 1875, 124,221 persons were tried at the instance of the police, and of these 117,231 were convicted and 6,990 acquitted. Dealing first with the counties, of the total number of persons charged, 26,333 were males and 4,505 females. Lanarkshire heading the list with 7,036 of the one and 989 of the other. The 5,049 offences against the person were made up principally of assaults, which reached the number of 4,480. The other offences in this category included 32 murders, or an average of 1 in each county. 35 attempts to murder, 29 charges of culpable homicide, 233 assaults on peace officers, 7 cases of bigamy, 37 of culpable neglect of duty. Chief among the 5,324 offences against property were the thefts, which reached 2,994, while there were also 1,687 cases of malicious mischief, 173 cases of fraud and attempted fraud, 14 cases of forgery and uttering, but only 7 base coin cases. Under the head of "miscellaneous" offences are set down 13,171 charges of assault, breach of the peace, and disorderly conduct; 53 of

begging; day poaching, 699; night poaching, 64; contempt of court, 13.

The number of 112,135 persons charged by the police in the burghs was made up of 78,184 males and 33,951 females. Glasgow, as might be expected from its large population, heads the list in the burghs with 59,238 charges; Edinburgh coming next, with 12,818 charges; then Dundee, with 6,437; and Greenock, with 4,555; last in point of numbers being Ardrossan, with 46 charges. In the whole of the burghs there were 7 charges of murder in the year, 42 of attempted murder. 15 of culpable homicide, 3,920 assaults, 257 assaults on peace officers, 50 cases of bigamy, 2 of child stealing, and 61 of culpable neglect of duty. Under the head of offences against property, 7,507 cases of theft head the list, though there were 370 cases of theft by house-breaking in addition. There were also 14 cases of forging and uttering, 186 charges of fraud and attempted fraud, 12 counterfeit cases, and 1,825 charges of malicious mischief. Under the head of "miscellaneous" appears the large number of 46,386 charges of assault, breach of peace, and disorderly conduct, 458 cases of begging, 2 cases of poaching, and 5,438 charges in contravention of the Public-house Act. In the whole country there were 2,891 persons committed for trial during the year 1875, but as 368 of these were discharged, the actual number called for trial was 2,523. These were thus disposed of:—2,205 were convicted, 32 were outlawed and their bail bonds forfeited, 6 were found insane and unfit for trial; 1 was acquitted on the ground of insanity, 83 were acquitted as not guilty, and 196 discharged from custody under a verdict of "not proven." During the year 3 persons were sentenced to death, 158 to penal servitude, 24 were ordered to be detained in reformatory schools, 1,992 to various terms of imprisonment from three years downwards. Of the whole number convicted, 24 were 12 years of age and under, and 722 between 21 and 30 years of age; 655 were convicted under aggravation of previous conviction, 41 were found to be "habit and repute thieves," and 66 were convicted of more than one offence.

In the next part of the return, which is devoted to prisons and prisoners, is shown the daily average of prisoners in the several Scotch gaols. In criminal prisons, in the year 1845, the daily average was 2,092, and in civil prisons the number was 74. In 1855, the numbers were respectively 2,316 and 62; in 1865, 2,416 and 62; and last year, 2,969 and 79. The number of persons received at gaols during 1875 was 44,144, but deducting from this those received by transference and removal from one prison to another, the net number was 43,393. The current expenses of the Scotch prisons were last year 101,876*l.* 12*s.* 3*d.*, as compared with 116,240*l.* 9*s.* 6*d.*; in 1874, 79,013*l.* 16*s.* 2*d.*, in 1871, and a quinquennial average of 96,551*l.* 7*s.* 6*d.* To meet the expenditure of last year, 5,719*l.* 3*s.* 5*d.* and 1,067*l.* 18*s.* 2*d.* were received from Parliament for maintenance of prisoners and removals respectively; assessments brought in 58,872*l.* 14*s.* 4*d.*; maintenance of military, naval, and revenue prisoners, 1,157*l.* 0*s.* 10*d.*; and employers and purchasers of work, 8,575*l.*

THE ANNUAL POOR-RATE RETURN.—The annual poor-rate return—its sixty-eighth annual publication—shows that in the parochial year ending at Lady-day, 1875, the expenditure for relief of the poor in England and Wales was 7,488,481*l.*, being 2·3 per cent. less than in the preceding year. It is 6*s.* 3½*d.* per head on the estimated population—a lower rate than in any year since 1866. There are some few charges not above included partly connected and partly unconnected with relief to the poor, and as is well known, there is a large amount of other local expenditure entirely unconnected with relief to the poor, such as the charges for police, Highway Boards, School Boards, rural sanitary authorities, &c., all of which are levied with, and under the name of poor-rate, and thus the total expenditure of the year was raised to 12,694,208*l.* After allowing for receipts in aid, the actual levy was no less than 12,483,133*l.*, the largest levy as "poor-rate" ever made in a year in this country. It is 10*s.* 5½*d.* per head on the estimated population. It was but 9*s.* ten years before, in the year 1864–65—viz., 6*s.* for the relief of the poor, and 3*s.* for the other charges, but these last have now grown from 3*s.* to a fraction over 4*s.* 2*d.* The rateable value of property assessed to the poor-rate in England and Wales was returned at nearly 94 millions in 1855-56, and nearly 116 millions in 1873–4, the gross estimated rental rising also from 110 millions to 136 millions. In the same period the total levy made under the name of poor-rate rose from 1*s.* 8·9*d.* in the pound on gross rental to 1*s.* 10*d.*, and on rateable value from 2*s.* 0·5*d.* to 2*s.* 1·9*d.*; but so far as the rate was caused by relief to the poor, there was a decline from 1*s.* 2*d.* to 1*s.* 1·2*d.* on gross value, and from 1*s.* 4·5*d.* to 1*s.* 3·5*d.* on rateable value. But the local poor-rate does not show all the expenditure for relief, for Parliament has to vote a large sum for inspection, medical salaries, and other charges and allowances.

RAILWAY ACCIDENTS.—The following is the official summary of accidents reported to the Board of Trade during the year 1875, showing the numbers of persons killed and injured on railways. In the course of the year 1875 there were reported 55 collisions between passenger trains or parts of passenger trains, by which 10 passengers were killed and 221 passengers and 12 servants of the Company were injured; 179 collisions between passenger trains and goods, or mineral trains, engines, &c., causing the death of 2 passengers and 1 servant, and injury to 678 passengers and 63 servants; 77 collisions between good

trains, &c., causing the death of 5 servants, and injury to 11 passengers (persons travelling in charge of cattle, &c.), and 60 servants; 7 collisions between light engines, injuring 5 servants; 87 passenger trains or parts of such trains, leaving the rails, causing the death of 2 passengers and 2 servants, and injury to 89 passengers and 12 servants; 60 goods trains, or parts of such trains, leaving the rails, causing the death of 4 servants and injury to 1 passenger and 5 servants; 75 instances of trains or engines being wrongly turned into sidings or otherwise through facing points, causing the death of 1 passenger and 2 servants, and injury to 51 passengers and 25 servants; 29 instances of trains running into stations at too high a speed causing injury to 54 passengers and 4 servants. There have also been reported 283 cases of trains running over cattle which had strayed on to the railways, and other obstructions, by which 1 servant was killed, and 8 passengers and 2 servants were injured; 79 cases of trains running through gates at level crossings, by which 1 servant was killed, and 4 were injured; 20 cases of the bursting of boilers, tubes, or gauge-glasses of engines, whereby 23 servants were injured: 660 failures of tires have been reported, resulting in the death of 1 servant and injury to 16 passengers and 2 servants; while 29 failures of couplings caused the death of 3 passengers and 1 servant, and injury to 40 passengers and 5 servants; 17 slips or cuttings or embankments caused the death of 2 servants and injury to 3 passengers and 3 servants; and fires in trains of which there were 21 cases, resulted in the death of 1 servant. There have also been reported 14 failures of machinery of engines, causing injury to 2 servants; 478 failures of axles, injuring 5 servants; 6 failures of brake apparatus, causing injury to 8 passengers; 7 failures of ropes used in working inclines, injuring 2 servants; 5 failures of tunnels, bridges, &c., injuring 1 servant; 476 broken rails, with injury to 1 servant; 8 cases of fire at stations, resulting in injury to 1 passenger; 112 failure of wheels, and 88 instances of the flooding of railways, not involving personal injury; and 36 other accidents, which caused injury to 33 passengers and 5 servants. Of the 660 tires which failed, 34 were engine tires, 17 were tender tires, 31 were carriage tires, 34 were van tires, and 544 were waggon tires; of the waggons 366 belonged to owners other than the railway companies; 123 of the tires were made of steel, 472 of iron, and of the remainder the material was not stated; 73 tires were fastened on to their wheels by Gibson's patent method, 55 by Beattie's patent, 4 by Mansell's patent, and 3 by Brotherhood's patent—in 4 of these instances (all Beattie's fastening) the tires left their wheels when they failed; 477 tires were secured to the wheels by bolts or rivets; of these 92 fractured at rivet-holes, and 29 flew off, in some portions from the wheels when they broke. In 359 cases the tires split longitudinally or bulged out, and in 22 the fractures occurred at the weld. Of the 478 axles which failed—259 were engine axles—viz.. 235 crank or driving, and 24 leading or trailing—18 were tender axles, 6 were carriage axles, and 195 were waggon axles. Of the waggons 66 belonged to owners other than the railway companies. Of the 476 rails which broke, 327 were double-headed, and of these 175 had previously been turned. Owing to the heavy rains, the floods caused considerable damage to many of the railways. During the year, 116 passengers were killed and 594 injured from their own want of caution or misconduct. Of these, 43 were killed and 105 injured by falling between trains and platforms; 19 were killed and 316 injured by falling on to the platforms, &c., when getting into or alighting from trains; 34 were killed and 35 injured when passing over the line at stations; 7 were killed and 35 injured by falling out of carriages during the travelling of trains; 44 were injured by the closing of carriage-doors; and 13 were killed and 59 injured through other causes. Of other persons included in this division 66 were killed and 41 injured while passing over railways at level crossings—viz., 38 killed and 28 injured at public level crossings, 10 killed and 4 injured at foot crossings, and 18 killed and 9 injured at occupation crossings; 248 were killed and 185 injured when trespassing on the railways; 25 persons committed suicide by throwing themselves on the lines in front of approaching trains; while of other persons not specifically classed, but mostly private people having business on the companies' premises, 52 were killed and 105 were injured. During the year 744 servants of companies or contractors were killed, and 3,377 injured. Of these, 104 were killed and 469 injured during shunting operations; 61 were killed and 185 injured by falling off engines, vans, waggons, &c.; 12 were killed and 25 injured by coming in contact with overbridges, &c., during the travelling of trains; 9 were killed and 58 injured by coming in contact while shunting, &c., with vehicles standing on adjoining lines; 61 were killed and 276 injured when getting on or off trains, engines, &c.; 19 were killed and 541 injured while loading or unloading goods and sheeting waggons; 14 were killed and 100 injured while breaking, spragging, or chocking wheels; 7 were killed and 1182 injured while working at cranes or capstans; 85 were killed and 186 injured while working on the permanent way; 11 were killed and 13 injured while walking along the railways on the way to their homes or work; 214 were killed and 228 injured while walking, crossing, or standing on the line; 24 were killed and 78 injured while passing between vehicles; 12 were killed and 122 injured while attending to the machinery of engines, cleaning them, &c.; 5 were killed and 2 injured while attending to gates at level crossings; 22 were killed and 54 in-

jured by falling or being caught between vehicles and platforms; 16 were killed and 121 injured by falling off ladders, scaffolds, or platforms; 5 were killed and 197 injured by the falling of waggon doors, timber, weights, &c.; 51 were killed and 347 injured while coupling or uncoupling vehicles; and 12 were killed and 193 injured from various other causes. Altogether, the numbers of persons killed and injured on the railways open for public traffic during the year ending the 31st of December, 1875, as reported to the Board of Trade, were as follows:—England and Wales—killed, 1,061; injured, 5,262. Scotland—killed, 188; injured, 437. Ireland—killed, 41; injured, 56. United Kingdom—killed, 1,290; injured, 5,755.

THE COST OF THE PAUPER POPULATION.—The cost of in-maintenance and out-door relief of paupers in England and Wales in the half-year ending at Lady-day 1876, amounted to 2,146,293*l.*, which is less by 79,465*l.*, or 3·6 per cent., than in the half-year ending at Lady-day, 1875, and less by 215,743*l.*, or 9·1 per cent., than in the half-year ending at Lady-day, 1874. The saving has been chiefly in out-door relief. The cost of this declined in the three half-years from 1,518,505*l.* to 1,435,983*l.*, and thence to 1,340,174*l.* The cost of in-maintenance was 843,531*l.*, 789,775*l.*, and 806,119*l.* in the three half-years respectively. Hence, in the half-year ending at Lady-day, 1876, as compared with the half-year ending at Lady-day, 1875, there was an increase of 16,344*l.* in the cost of in-maintenance, but a decrease of 95,809*l.* in the cost of out-door relief. The net decrease thus shown is general throughout the kingdom, the chief exceptions in the list of counties being an increase of 4·2 per cent. in Derbyshire, and of no less than 30·1 per cent. in the North Riding of Yorkshire; but the comparison in this last instance is "subject to correction," owing to some parishes with a population of about 50,000 being included which have been heretofore part of a Durham union. The return shows that about six-sevenths of the total expenditure for out-door relief were given in money, and that all the out-door relief was given in money in 124 of the 649 unions. The average price of wheat in the half-year ending at Lady-day, 1874, was 61*s.* 8*d.*; Lady-day, 1875, 43*s.* 6*d.*; and Lady-day, 1876, 45*s.* 2*d.* per quarter. The Lambeth return shows a decrease in the contract price of the 4lb. loaf from 6*d.* in 1874 to 5*d.* in 1856; in mutton and beef, from 9*s.* 5½*d.* per stone of 14 lbs., in 1874, to 9*s.* 4*d.* in 1876; and in butter, from 1*s.* 1*d.* to 10½*d*; but an increase in potatoes from 91*s.* 8*d.* to 100*s.* per ton.

PRISON STATISTICS OF GREAT BRITAIN.—A parliamentary return respecting the prisons of Great Britain, obtained by Colonel Beresford, shows that the daily average number of prisoners in custody in the prisons of England and Wales is 18,130. The "average annual cost per prisoner without allowing for earnings of labour," ranges in the various prisons from 113*l.* 5*s.* (in Lincoln county prison), to 6*l.* 6*s.* 8*d.* (in Montgomery county prison), and the total of this column in the return is stated, not very intelligibly, to be 4,363*l.* The "average annual net profit of each prisoner's labour" ranges from 49*l.* 13*s.* 4*d.* (in Nottingham county prison), to 1*s.* (in Portsmouth borough prison and Bury St. Edmund's county prison). The return gives the "total" as 425*l.* 14*s.* 3*d.* The "average annual cost per prisoner, after deducting net profit on prison labour," ranges from 113*l.* 1*s.* 4*d.* (in Lincoln county prison), to 1*l.* 6*s.* 4*d.* (in Nottingham county prison). The "total" of this column is given as 3,937*l.* 5*s.* 9*d.* The return also gives for each prison the proportion of re-committals to the total number committed. In Scotland the daily average number of prisoners is 2,851. The annual cost per prisoner, on the whole of the prisons, is 24*l.* 15*s.* 8*d.*; the average profit per prisoner for work sold, 2*l.* 8*s.* 6*d.*; and the average loss per prisoner on work, 2*d.*

THE PAUPER ROLL AT LADY-DAY, 1876.—The Lady-day return issued by the Local Government Board shows that the number of persons then receiving relief from the rates in England and Wales was 700,332, which number shows a decrease of 76,169, or 9·8 per cent., compared with the number at Lady-day, 1875, and of 10·8 per cent. compared with Lady-day, 1874. The improvement thus shown in the present year compared with 1875 extends to every one of the eleven divisions of England, but it was as small as 2·0 per cent. in Yorkshire, and it ranged from 5·6 to 9·1 per cent. in six other divisions. There are only four in which it exceeded the average of 9·8 per cent., namely, the South Midland and the Eastern divisions, in which it was 10·8 and 10·9 per cent.; the Metropolis, 11·4 per cent.; and the Welsh division as much as 25·9 per cent., owing to the comparison being with a time of trouble in the iron and coal trades. But about 3 per cent. should be added to all the figures, owing to these returns not including vagrants nor paupers in lunatic asylums.

FIRES IN LONDON IN 1875.—The number of calls for fires or supposed fires reported by Captain Shaw to have been received by the Metropolitan Fire Brigade during 1875 was 1,668. Of these, 90 were false alarms; 49 proved to be only "chimney alarms:" and 1,529 were calls for fires, of which 163 resulted in serious damage, and 1,366 in slight damage. The fires of 1875 compared with those of 1874, show a decrease of 44, and compared with the average of the last ten years there was a decrease of 49.

6. EDUCATION, SCIENCE, AND ART.

PROGRESS OF EDUCATION IN GREAT BRITAIN.—The following table exhibits the progress of education in Great Britain in schools under Government inspection from 1859 to 1875, distinguishing England and Wales from Scotland:—

Years ended 31st August.	Number of Schools Inspected.	Number of Children who can be Accommodated.	Average number of Children in Attendance.	Number of Children present at Inspection.
	ENGLAND and WALES (including ISLE OF MAN and ROMAN CATHOLIC SCHOOLS for GREAT BRITAIN).			
1859	5,531	1,054,813	674,602	757,082
1864	6,470	1,332,553	862,817	983,928
1869	8,592	1,838,416	1,153,572	1,448,299
1874	13,084	2,952,479	1,710,806	2,093,180
1875	14,067	3,229,112	1,863,176	2,273,721
	SCOTLAND (exclusive of ROMAN CATHOLIC SCHOOLS, included above).			
1859	1,055	154,228	126,799	123,049
1864	1,421	188,904	148,317	149,363
1869	1,745	237,928	179,214	191,203
1874	2,587	391,592	274,588	314,576
1875	2,890	407,002	312,346	357,668
	TOTAL FOR GREAT BRITAIN.			
1859	6,586	1,209,041	801,401	880,131
1864	7,891	1,521,457	1,011,134	1,133,291
1869	10,337	2,076,344	1,332,786	1,639,502
1874	15,671	3,344,071	1,985,394	2,407,756
1875	16,957	3,636,114	2,175,522	2,631,389

ANNUAL PARLIAMENTARY GRANTS FOR EDUCATION IN ENGLAND FROM 1833 TO 1876.

1833—1838	£20,000	1861 . .	£803,794
1839—1841	30,000	1862 . .	842,119
1842—1844	40,000	1863 . .	804,002
1845 . .	75,000	1864 . .	705,404
1846—1850	115,000	1865 . .	693,078
1851 . . .	150,000	1866 . .	694,530
1852 . .	160,000	1867 . .	705,865
1853 . .	260,000	1868 . .	781,324
1854 . .	263,000	1869 . .	840,711
1855 . .	396,921	1870 . .	914,721
1856 . .	451,213	1871 . .	1,458,402
1857 . .	541,233	1872 . .	1,551,560
1858 . .	663,435	1873 . .	1,299,803
1859 . .	836,920	1874 . .	1,356,852
1860 . .	798,167	1875 . .	1,548,563
1876 . . .	£1,707,055		

SCHOOL BUILDING.—From a return to the House of Commons, procured by Mr. Heygate, it is shown that from 1851 to 1875 inclusive, the amount contributed by the Church of England towards building schools was 3,702,249*l.*, and maintenance 6,623,767*l.*; by the British Wesleyan and other Nonconformist bodies 389,699*l.* towards the building, and 1,125,853*l.* maintenance; by Roman Catholics, 122,478*l.* building, and 391,436*l.* maintenance. By the Government the amount contributed was—building 1,385,676*l.*, and maintenance 11,005,452*l.* The total amount by the Government from 1839, when the Education Department was formed, to 1850, was 349,926*l.* for building purposes. The first grants by the Government towards the maintenance of schools were paid in the year 1848. The present return was made by the Education Department.

DISTRIBUTION OF THE GOVERNMENT GRANTS.—It appears from a Parliamentary paper that the expenditure in education grants for the year ending March 31, 1875, came to 1,356,748*l.* 19*s.* 5*d.*, being an increase of 134,812*l.* 7*s.* 1*d.* as compared with the year 1874. The cost of administration appears to be 126,141*l.* 10*s.* 5*d.*, showing an increase of 11,813*l.* 1*s.* 7*d.* over the charges for the previous year. The greater part of the grants go to schools connected with the Church of England. These institutions get 822,565*l.* 9*s.* 5*d.*, being an increase of 38,337*l.* 13*s.* 1*d.* over 1874. Altogether since 1869, the time that the system of public instruction began to take definite shape, the Church of England has received, in the form of Government grants, 10,163,441*l.*

6*s.* 7*d.*, compared with the 2,669,894*l.* 6*s.* 6*d.*, which during that time has been granted to British, Wesleyan, and other elementary schools. In 1874–5, this latter class of schools got 255,887*l.* 6*s.* 6*d.* from Government, the increase, as compared with the previous year, being only 1,050*l.* 8*s.* 11*d.* As for board schools, they only got 90,231*l.* 10*s.* 10*d.* last year, about one-ninth as much as was given to the schools of the Church of England, and only about 16,000*l.* more than was given to the schools of the Roman Catholic Church. In the latter case, the increase in the grants in aid for 1875, as compared with those for 1874, amount to 9,168*l.* 12*s.* 5*d.* As the education grant is paid according to the standard of efficiency attained by the scholars, it will be seen that the Church schools stand highest in the educational machinery of the country.

THE BRITISH MUSEUM.—According to a return procured by Mr. Kay-Shuttleworth, the total number of visitors at the British Museum, from October, 1804, when the numbers were first ascertained, to the end of 1875, was 29,721,355, of which 25,445,035 were to the general collections. In 1875 the number of visitors was 663,898, against 601,843 in 1874. In 1875 the number of visitors to the general collections was 523,317; to the reading room, 105,310; to the galleries of sculpture, 7,219; print room, 3,713; to the coin and medal room, 1,713; ornament room, 14,785; natural history departments, 5,870; to the department of manuscripts, 1,785; and to the department of maps, 186. The document also contains an abstract of amounts expended in the two financial years 1873–54 and 1874–75, as also the amounts paid from Parliamentary and other funds. In one part of the return the expense of maintenance is given, "from the foundation of the Museum, in 1753," to 1875, and in another part of purchases "from the foundation of the Museum, in 1753," to March 31, 1875.

THE BUDGET OF THE LONDON SCHOOL BOARD.—In the financial statement laid before the London School Board the Finance Committee report that for the year from March, 1876, to March, 1877, the estimated liabilities amount to 398,867*l.*, including a deficiency of 69,245*l.* for the year ending March 25, 1876. This large deficit has arisen chiefly from two causes, one of which relates back to the estimates for the year 1875–1876, the deficiency on the year ending March, 1875, having been reckoned in those estimates at 33,834*l.*, whereas when the accounts came to be made up the actual deficiency was found to amount to as much 46,920*l.* This accounts for 13,086*l.* of the present deficiency, and the remaining 53,056*l.* is accounted for by the expenditure for the maintenance of schools during the past year having been very much in excess of the sum at which it was calculated. This excess, it appears, is due almost entirely to the increase in the amounts paid for salaries to teachers. The estimates for the coming financial year amount, as we have said, to 398,867*l.*, and this includes an increase of 70,402*l.* in the charge for school maintenance as compared with last year. All the other items of charge are also increased in various proportions, and the whole amount of the estimates shows an increase of 135,153*l.* over those for the year ending 1876. Inasmuch, however, as these were under-estimated by 69,245*l.*, and those of the previous year by 13,086*l.*, the estimates of last year may be reckoned as having been under-estimated, so far as the current expenses of the year were concerned, by the sum of 69,245*l.* less 13,086*l.* —that is, by 56,159*l.* The real advance, therefore, in the estimates for the forthcoming year, so far as current expenses are concerned, ought to be taken not at 131,153*l.*, but at this sum less 56,159*l.*, or at 74,994*l.*

PRIMARY EDUCATION IN IRELAND.—The Commissioners of National Education in Ireland report that there were in 1875 upon the rolls of their schools 1,011,799 children, and that returns obtained relating to 1,007,671 of these pupils show that 798,024 were Roman Catholics. But in these returns of the numbers on the rolls a child attending different schools in the year is counted at each of them. The number on the rolls on the last day of the month immediately preceding the annual examination in 1875, and who had actually attended school on any of the fourteen days immediately before that date, was but 577,541, and the average daily attendance for the year was 389,961, being less by 5,420 than in the preceding year. Of the above 798,024 Roman Catholic children on the rolls, 401,199 were in schools under Roman Catholic teachers, and attended by Roman Catholic children only. The returns show 396,827 Roman Catholic children in schools with a mixed attendance of children, but 361,724 of this number were in schools under Roman Catholic teachers exclusively, and only 8,591 were in schools under Roman Catholic and Protestant teachers conjointly, and 26,512 in schools under Protestant teachers exclusively. Of 209,291 Protestant children on the rolls, less than 46,000 were in schools under Protestant teachers and attended by Protestant children exclusively, and nearly 164,000 were in schools with a mixed attendance, but three-fourths of this last number were in schools under Protestant teachers exclusively.

7. EMIGRATION.

EMIGRATION IN 1875.—The Statistical and Commercial Department of the Board of Trade has issued the following Return of the numbers of persons who left the United Kingdom in the year 1875 for places out of Europe:—

Port of Departure.	United States.	British North America.	Australian Colonies.	All other Places.	Total:
Liverpool	72,350	14,069	932	2,189	89,540
London	2,692	126	20,464	3,497	26,779
Plymouth	—	—	7,413	667	8,080
Total England from ports at which there are Emigration Officers	75,042	14,195	28,809	6,353	124,399
Total from all other ports	1,135	7	449	9,316	10,907
Total England	76,177	14,202	29,258	15,669	135,306
Glasgow and Greenock (being the total Scotland from ports at which there are Emigration Officers)	8,492	1,864	4,534	180	15,070
Total from all other ports	—	—	28	11	39
Total Scotland	8,492	1,864	4,562	191	15,109
Cork	16,611	60	703	—	17,374
Londonderry	3,090	1,022	—	—.	4,112
Total Ireland from ports at which there are Emigration Officers	19,701	1,082	703	—	21,486
Total from all other ports	676	230	1,002	—	1,908
Total Ireland	20,377	1,312	1,705	—	23,394
Total from ports at which there are Emigration Officers	103,235	17,141	34,046	6,533	160,955
Total from all other ports	1,811	237	1,479	9,327	12,854
Grand Total United Kingdom	105,046	17,378	35,525	15,860	173,809
Total in 1874	148,161	25,450	53,958	13,445	241,014

Table showing the Origin of the Persons comprised in the above Return.

Destination.	English.	Scotch.	Irish.	Foreigners.	Not distinguished.	Total.
United States	43,867	5,893	31,433	23,028	825	105,046
North American Colonies	9,044	1,871	1,391	5,016	56	17,378
Australian Colonies	20,749	5,750	8,251	767	8	35,525
All other places	10,880	1,172	374	2,536	898	15,860
Total	84,540	14,686	41,449	31,347	1 787	173,809
Total in 1874	116,490	20,286	60,496	38,465	5,277	241,014

N.B.—Of the total number of passengers in 1875, 37,865 were cabin and 135,944 steerage; but the returns do not distinguish between bonâ fide settlers and ordinary travellers.

8. THE POST OFFICE.

THE WORK OF 1875.—By the establishment of 264 new offices during the year the total number of Post Offices in the United Kingdom was raised to 13,226; and of this number 886 are head offices. The number of road letter boxes was increased from 9,671 in 1874, to 10,186 in 1875. Thus, the total number of postal receptacles in the United Kingdom is now 23,412; as compared with 16,246 ten years ago, and with little more than 4,500 before the establishment of Penny Postage in 1840. In London alone there are 1,744 such receptacles. The following table shows the estimated number of letters, post cards, book packets, and newspapers which passed through the Post in 1875, as also the rate of increase on the previous year, together with the proportion of letters to population.

	No. of Letters in 1875.	Increase per cent. on No. in 1874.	No. of Post Cards in 1875.	Increase per cent. on No. in 1874.
England and Wales ..	846,852,400	5·3	73,369,100	11·6
Ireland	70,563,300	0·8	4,540,900	5·5
Scotland	90,976,400	0·9	9,206,300	6·7
United Kingdom ..	1,008,392,100	4·2	87,116,300	10·7

	No. of Book Packets and Newspapers in 1875.	Increase per cent. on No. in 1874.	No. of Letters per head.
England and Wales ..	226,740,500	9·7	35
Ireland	23,432,700	2·6	13
Scotland	29,542,800	0·5	26
United Kingdom ..	279,716,000	8·0	31

The number of registered letters in the United Kingdom during the year was 4,313,404, or about one in 234 of the whole number of letters. The number of letters received in the Returned Letter Office was 4,346,300; being about one in every 232 of the total number of letters. It was found possible either to return to the writers, or to re-issue nearly nine-tenths of the whole number received. Fewer letters reached the Returned Letter Office in 1875 than in 1874, but the decrease is due to the fact that the number in 1874 was unusually high in consequence of the General Election of that year. Had there been no disturbing cause of this kind, it is estimated that the letters dealt with in 1875 would have exceeded those of the preceding year by 30,000. Upwards of 25,500 letters were posted without any address; of which number 464 contained in the aggregate nearly 500*l.* in cash and bank notes, and nearly 6,000*l.* in cheques, &c. The number of newspapers for places abroad detained for insufficient postage or other cause, which in 1874 was 173,000, was in 1875 only 166,000, showing a decrease of 7,000. Nearly 65,000 postage stamps were found loose in the different post offices.

TELEGRAPH DEPARTMENT.—The increase in the amount of telegraph business, although not so great as in previous years, has still been satisfactory, nearly 1,650,000 more messages having been dealt with in 1875 than in 1874. The amount of matter transmitted on behalf of the Press was also largely in excess of the amount transmitted in any previous year, the number of words so transmitted and delivered to newspapers, clubs, exchanges, &c., being upwards of 220,000,000. The number of post offices open for the transaction of telegraph business at the end of the year was 3,730 or 31 more than the number open at the end of 1874. The number of new offices is small as compared with the number opened in some former years, but the telegraph system had already been extended to nearly every place at which it was considered probable that the revenue would be sufficient to meet the expense involved. Of the 31 new offices, most of them were opened at the request of the inhabitants of the district, who guaranteed the Department against actual loss. In addition to the 3,730 post offices 1,872 railway stations were open for the transaction of public telegraph business.

MONEY ORDERS.—In the United Kingdom 192 additional Money Order Offices were opened during 1875, bringing the total number up to 5,260. The number of inland orders in the year was 16,485,661, being an increase of 585,099 or $3\frac{7}{16}$ per cent. on 1874. The aggregate amount of

the orders was 26,497,918*l*., and the average value of the orders 1*l*. 12*s*. 2*d*.

SAVINGS BANK DEPARTMENT.—During the year 1875, 163 new offices were opened in England and Wales; 21 in Scotland; and 8 in Ireland; the total number of offices in the United Kingdom being thereby raised to 5,260. Since the establishment of Post-office Savings Banks, fourteen years ago, the number of Old Savings Banks in the United Kingdom has diminished from 638 to 473; and the whole number of Old Savings Banks is now considerably less than the number of Post-office Savings Banks in the London district alone, which is 580. The number of depositors has increased by 108,370, this addition raising the total number of persons having accounts open at the end of the year to 1,777,103. The total amount of the balances at the credit of depositors, together with interest accrued, at the close of 1875 was 25,187,345*l*., being an increase of 2,029,876*l*. on the total of the previous year. The whole amount of the sums deposited during the year was 8,783,852*l*., and that of the sums withdrawn, 7,325,560*l*. The amount of interest credited to depositors during the year was 571,584*l*.; showing an increase of 47,025*l*. on the amount of the previous year. The average amount of the deposits was 2*l*. 16*s*. 1*d*. as against 2*l*. 14*s*. 10*d*. in 1874; so that there was a recurrence of the peculiarity manifested in 1874 of the deposit average increasing instead of gradually decreasing as in years prior to 1874. As regards withdrawals the average was 6*l*. 11*s*. 8*d*., the increase in the average common to former years being maintained. The proportion of depositors to population was 1 to about 18 in the United Kingdom; or 1 to about 14 in England and Wales; 1 to about 69 in Scotland; and 1 to about 89 in Ireland; while the average amount to the credit of each depositor, which was over 14*l*. in the United Kingdom, with a slight excess of that sum as regards England and Wales, showed an increased disparity in the sister kingdoms, being considerably less than 9*l*. in Scotland, and fully 17*l*. in Ireland. The average daily number of deposits was 10,236; but on the 1st February, on which the largest number was received, there were 21,626. Of the total number of deposits and withdrawals last year, 28 per cent. were made at offices other than those at which the accounts were originally opened. In 1874 the proportion of such transactions was 26 per cent.; in 1868, 19 per cent.; and in the first year of the establishment of Post-office Savings Banks only a little over 4 per cent.

STAFF AND REVENUE.—During 1875 the number of officers was increased by 662; and the total is now 44,644, of whom 11,605 are employed exclusively on telegraph work. The number of post-masters is 13,226; of clerks there are nearly 10,000; and of letter carriers, sorters, and messengers, over 21,000. Of this staff, nearly 10,250 are employed in London; and of these over 5,500 are attached to the chief offices in St. Martin's-le-Grand. The gross revenue from postage and money orders, properly appertaining to the year, was 5,815,000*l*. being an increase of 164,000*l*. on the like revenue of the previous year. The expenditure properly appertaining to the year was 3,921,000*l*. as compared with 3,915,000*l*. in 1874, showing an increase of only 6,000*l*. The chief items of expense were 1,942,000*l*. for salaries, wages, pensions, &c.; 836,000*l*. for conveyance by mail packets and private ships; 667,000*l*. for conveyance by railway; 162,000*l*. for conveyance by coaches, carts, and omnibuses; and 143,000*l*. for buildings, repairs, &c. As compared with the figures of 1874, these items exhibit an increase of 68,000*l*. for salaries, &c.; of 17,000*l*. for conveyance by railway; of 5,000*l*. for conveyance by coaches, &c.; and a decrease of 80,000*l*. for conveyance by mail packet and private ships; and of 26,000*l*. for buildings, &c. The net revenue was 1,894,000*l*. as compared with 1,836,000*l*. in 1874; showing an increase of 58,000*l*. The gross earnings of the telegraph service in the year 1875 amounted to 1,187,313*l*., while the expenditure was 1,044,166*l*., so that the net earnings amounted to 143,147*l*. During the previous year the net earnings applicable to the payment of interest upon the capital raised for the purchase of the telegraphs were 109,000*l*. The increase in the net earnings is therefore 34,147*l*.

MISCELLANEOUS.—If the work of and business of the Post Office in 1875 be described on the principle of average, the following results are shown:—The post carried 31 letters for every man, woman, and child in the United Kingdom; or, in detail, 35 each in England and Wales, 26 in Scotland, 13 in Ireland. There was a registered letter in the year for one in every seven or eight persons in the United Kingdom. The postman brought eight newspapers or book-packets for every person, and his load of post-cards was sufficient to allow every person to be addressed at least twice in the year (most of them thrice) by open post-card. Telegrams are to letters as 1 to 50, and the number of telegrams sent in 1875 was nearly equal to two-thirds of the population, a telegram to each of two persons in every three. The inland money orders were equal in number to half the population, one for every two persons; in England three money orders to every five persons, in Scotland two to every five persons, in Ireland one to every five persons. The depositors in Post Office Savings Banks in the United Kingdom were one in about 18 of the population; one in about 14 in England and Wales, one in about 69 in Scotland, one in about 89 in Ireland.

9. SOCIAL ECONOMY.

LOAN SOCIETIES FROM 1870 TO 1874.—The number as published indicates great variation during the past five years. In 1872 there were seventy-one societies more than in 1870, and in 1874 there were twenty above the return of 1870. The statistics fall into three sections—the first more particularly concerning the proprietary, the second relates to the borrowers, and the third to the steps taken to enforce payments from defaulters.

Capital Paid up during each Year, and Amount out at Interest at the close of each Year 1870-74.

Year.	Number of Societies.	Number of Members at close of the Year.	Capital of Depositors and Shareholders Paid up in the Year.	Sums in Borrowers' hands at close of Year.	Management Expenses.	Net Profit.
	£	£	£	£	£	£
1870	531	34,883	201,191	400,712	17,678	19,958
1871	500	32,499	201,823	392,310	17,583	21,012
1872	460	30,308	194,023	381,861	18,520	18,617
1873	464	32,100	204,128	380,543	17,797	19,408
1874	480	33,614	199,365	407,744	19,661	21,195

Though the number of societies has fluctuated, the capital yearly paid up has been a steady quantity, averaging 200,106*l*. The average of the sums in the hands of borrowers on the 31st of December was nearly twice the subscribed capital of the year, being 392,634*l*. The management expenses amounted on the average to 18,248*l*., and the net profits to 20,038*l*. Since these two items are met by borrowers' interest and fees, those charges may be taken at 40,000*l*. a year, after providing for the bad debts.

Number of Borrowers, the Sum Circulated; also Borrowers' Charges and Interest, 1870-1874.

Year.	Number of Borrowers during the Year.	Amount Circulated during the Year.	Amount paid by Borrowers for		Losses to the Societies.
			Forms of Application.	Interest.	
		£	£	£	£
1870	132,933	661,753	8,696	31,589	1,812
1871	130,390	621,223	8,627	33,409	1,930
1872	128,068	634,869	8,267	31,032	2,082
1873	124,664	613,963	7,891	30,568	1,947
1874	126,886	636,472	7,967	32,920	2,316

The average number of borrowers was 128,590; the average amount circulated 633,656*l*. This gives as average amount per borrower of 4*l*. 18*s*. 4*d*.

Number of Defaults, Amount of Defaults, and Sums Recovered—1870-1874.

Year.	Summonses issued in the Year.	Distress Warrants issued in the Year.	Sums for which Summonses were issued in the Year.	Sums recovered in the Year.
			£	£
1870	9,809	2,137	21,138	16,957
1871	9,262	2,048	18,434	18,220
1872	9,004	1,798	18,492	16,702
1873	8,201	1,614	15,896	12,772
1874	8,783	1,751	19,246	15,262

Looking to the number of transactions and the needy condition of the borrowers, the ultimate defaults are not many. The summonses issued were on the average 9,012; not much more than one-fifth—*i.e.*, 1,870—were followed up by distress warrants. The yearly sum in default was 18,641; the recoveries thereout but little short of 16,000*l.* During the year 1874, the societies stated their total losses to be 2,316*l.*; the costs which they were put to in recovering loans were 2,481*l.*; the amount of costs paid by borrowers or their sureties was 2,122*l.* There are no means of estimating from the data of these returns what rate of interest per annum the societies exact from their borrowers.

LOAN SOCIETIES in 1875.—The recently issued Parliamentary paper relating to loan societies in England and Wales shows the number of members on the 31st December last as 22,776; the amount actually paid by depositors or shareholders in the year, 128,512*l.*; sums in "borrowers' hands" on the 31st of December, 308,178*l.*; the amount circulated in borrowers' hands in 1875, 457,723*l.*; number of applications for loans in the year, 90,388; number of borrowers to whom loans were granted in the year, 83,768; amount paid for forms of application and inquiry in the year, 5,263*l.*; the amount paid for interest by borrowers or sureties in 1875, 23,228*l.*; expense of management in the year, 13,859*l.*; net profits, after paying expenses of management, 13,523*l.*; losses in the year, 1,617*l.*; number of summonses issued in 1875, 6,028; number of distress warrants, 1,269; the amount recovered by summonses in the year, 13,610*l.*; amount recovered in 1875, 11,460*l.*; amount of costs incurred in recovering loans, 1,678*l.*; and the amount of costs paid by borrowers and sureties in the year, 1,444*l.*

SAVINGS BANKS.—Mr. Torr, M.P., has obtained a return, in a Parliamentary Blue-book, giving information as to every savings bank in the United Kingdom. In England there are 355 banks, and in Wales 22—377. In England and Wales there are 396 unpaid and 1,290 paid officers. The amount of security given by unpaid officers is 301,520*l.*, and by paid officers 299,550*l.* The salaries and allowances to paid officers amount to 87,725*l.* 18*s.* The annual expenses of management, inclusive of all payments, for the year ended the 20th of November last, were 113,117*l.* 7*s.* 9*d.* There were 1,149,443 accounts opened on the 20th of November. The total amount owing to depositors on that day was 34,538,495*l.* 3*s.* 8*d.* The total amount invested with the National Debt Commissioners on the same day, excluding the surplus fund, was 34,430,901*l.* 1*s.* 3*d.* Balances in the hands of treasurers on the 20th of November amounted to 265,169*l.* 18*s.* 3*d.* The average rate of interest paid to depositers was 2*l.* 19*s.* 5*d.* The separate surplus fund in the hands of the Commissioners was, on the 20th of November, 367,519*l.* 18*s.* 5*d.* The number of life annuities was 9,457 immediate, and 880 deferred. For terms of years there were 274 immediate and 15 deferred. The annual number of receipts from depositors in the year ended as stated, was 1,198,580, and the annual payments 646,355. The average receipt was 4*l.* 19*s.* 6*d.*, and payments 9*l.* 11*s.* 5*d.*

SCHOOL BOARD SAVINGS BANKS.—A return made by the Education Department, relating to savings banks connected with School Boards, shows that, in the year ending with March, 1876, 6,085 scholars deposited 1,137*l.* The return shows also that in nine provincial towns 2,133 scholars deposited 385*l.* The whole 8,218 scholars, therefore, deposited 1,766*l.*, and the school fees paid for them from the time at which they respectively became depositors amounted to 1,255*l.* in the whole.

10. MISCELLANEOUS.

LONDON PARKS AND RECREATION GROUNDS.—In addition to the greater parks of London vested in the Crown, but open to the public, the Metropolitan Board of Works state, in the report they have issued this year, that there are under their management about 1,100 acres of public recreation-grounds in various parts of the metropolis and its suburbs. There is Blackheath, comprising 267 acres; Hampstead-heath, 240 acres; Finsbury Park, 115 acres; Southwark Park, 63 acres; Hackney Downs, 50 acres; Well street (Hackney) Common, 30 acres; North and South Mill Fields, 57 acres; London Fields, 27 acres; Tooting Beck Common, 144 acres; and Tooting Graveney Common, 63 acres. The gardens on the Thames Embankment and in Leicester-square present 14 acres. The remainder of the 1,894 acres is made up of Clapton Common, Stoke Newington Common, and Shepherd's Bush Common.

PATENTS.—The report of the Commissioners of Patents for Inventions for the year 1875 shows that the number of applications for letters patent recorded within the year was 4,561, the number of patents passed thereon was 3,112, the number of final specifications filed in pursuance thereof was 2,887, and the number of complete specifications upon which patents were sealed was 162. The number of applications lapsed or forfeited, the applicants having neglected to proceed for their patents within the six months of protection, was 1,173; the number of patents void, the patentees having neglected to file final specifications, was 63, leaving 3,049 patents in force. The aggregate surplus income on balance of accounts from the

1st October, 1852, to the end of the year 1875, amounted to 1,329,772*l.*

CIVIL LIST PENSIONS.—The following is a list of all pensions granted during the year ended the 20th of June, 1876, and charged upon the Civil List, making a total of 1,200*l.* :—Miss Florence Emily Sophia Birch, 75*l.*, in recognition of the services of her father, the late Mr. J. W. W. Birch, British Resident at the Court of Perak, and in consideration of the sad circumstances in which she is placed by his untimely death. Mr. Arthur Birch, 75*l.*, in recognition of the services of his father, the late Mr. J. W. W. Birch, British Resident at the Court of Perak, and in consideration of the sad circumstances in which he is placed by his untimely death. Miss Constance Alice Birch, 75*l.*, in recognition of the services of her father, the late Mr. J. W. W. Birch, British Resident at the Court of Perak, and in consideration of the sad circumstances in which she is placed by his untimely death, Caroline Catherine, Lady Wilkinson, 150*l.*, in recognition of the services rendered to science and archæological literature by her late husband, Sir John Gardner Wilkinson, D.C.L., F.R.S. Dr. John Brown, F.R.C.P.E., 100*l.*, in consideration of his services to literature. Mrs. Sarah Anne Tregelles, 100*l.*, in consideration of the theological labours of her husband, Dr. Samuel Tregelles. Mrs. Mary Anne Wesley, 100*l.*, in recognition of the musical talents of her late husband, Dr. Samuel Sebastian Wesley. Mrs. Emily Margaret Brooks, 100*l.*, in recognition of the literary services of her late husband, Mr. Shirley Brooks. Mrs. Catherine Matilda Banim, 50*l.*, in recognition of the services rendered to Irish literature by her late husband, Mr. Michael Banim. Mrs. Hannah Emlyn Jones, 100*l.*, in recognition of the services rendered to literature by her late husband, an eminent Welsh scholar. Dr. Henry Wybrowe Rumsey, F.R.S., 100*l.*, in recognition of the long and able services which he has rendered to the public in connection with sanitary science. Mr. Henry Watts, F.R.S., 100*l.*, in consideration of his distinguished services in the cause of science. The Rev. John George Wood, 100*l.*, in consideration of his services to literature.

REGISTERED ELECTORS IN THE UNITED KINGDOM.—It appears from a Parliamentary return, that the total number of registered electors in the Parliamentary constituencies of England is 2,340,763; in Ireland, 230,773, and in Scotland, 295,420; making a total for the United Kingdom of 2,866,956. The number of borough electors in England and Wales is 1,484,844; county electors, 843,803; and University electors, 12,116. In Ireland, the numbers are—counties, 173,680; boroughs, 53,590; University, 3,323. In Scotland, the numbers are—boroughs, 193,725; counties, 86,412; Universities, 10,283.

THE LONDON HOSPITAL SUNDAY FUND.—The Hospital Sunday Fund for 1876 was voted by the committee in the following proportions:—23,943*l.* to sixty-nine general and special hospitals and four institutions, and 2,336*l.* 16*s.* 8*d.* to forty-five dispensaries. The awards to the hospitals were as follows:— General hospitals. — Charing Cross, 816*l.* 13*s.* 4*d.*; French, 122*l.* 10*s.*; German, 632*l.* 4*s.* 4*d.*; Great Northern, 259*l.* 14*s.*; King's College, 1,164*l.* 3*s.* 10*d.*; London, 2,307*l.* 16*s.* 8*d.*; Metropolitan Free, 291*l.* 13*s.* 4*d.*; Poplar, 350*l.*; Royal Free, 641*l.* 13*s.* 4*d.*; St. George's, 2,100*l.*; ditto, on account of tank accident, 233*l.* 6*s.* 8*d.*; SS. John and Elizabeth, 151*l.* 13*s.* 4*d.*; St. Mary's, 1,050*l.*; Seamen's, 816*l.* 13*s.* 4*d* ; the Middlesex, 1,633*l.* 6*s.* 8*d.*; University College, 862*l.* 4*s.* 9*d.*; Westminster, 758*l.* 6*s.* 8*d.* Special hospitals, viz. :—Chest hospitals.—City of London for Diseases of the Chest, 700*l.*; Hospital for Consumption, 888*l.* 9*s.* 5*d.*; North London Consumption, 239*l.* 3*s.* 4*d.*; Royal Hospital for Diseases of the Chest, 116*l.* 13*s.* 1*d.*. Children's hospitals.—Belgrave, 105*l.*; East London, 235*l.*; Evelina, 348*l.*; Hospital for Sick Children, 408*l.* 6*s.* 8*d.*; Home for Sick Children and South London Dispensary for Women, 59*l.* 10*s.*; Hospital for Hip Disease in Childhood, 140*l.*; North-Eastern, 140*l.*; Victoria, 190*l.* 7*s.* 1*d.* Lying-in hospitals.—British, 58*l.* 6*s.* 8*d.*; City of London, 58*l.* 6*s.* 8*d.*; General, 87*l.* 10*s.*; Queen Charlotte's, 151*l.* 13*s.* 4*d.* Hospitals for Women.—Hospital for Women (Soho Square), 175*l.*; Hospital for Women and Children, 41*l.* 13*s.* 4*d.*; New Hospital for Women, 110*l.* 16*s.* 8*d.*; Royal Infirmary for Diseases of Women and Children, 116*l.* 13*s.* 4*d.*; Samaritan Free, 327*l.* 16*s.* 8*d.* Other special hospitals.—Cancer, 70*l.*; London Fever Hospital, 262*l.* 10*s.*; St. Mark's (Fistula), 175*l.*; National, for Diseases of the Heart, 70*l.*; Lock Hospital (Female), 175*l.*; Lock Hospital (Male), 163*l.* 6*s.* 8*d.*; Hospital for Diseases of the Nervous System, 116*l.* 13*s.* 4*d.*; National, for Paralysis and Epilepsy, 303*l.* 6*s.* 8*d.*; Royal London Ophthalmic, 347*l.* 2*s.* 11*d.*; Royal South London Ophthalmic, 35*l.*; Royal Westminster Ophthalmic, 93*l.* 6*s.* 8*d.*; Western Ophthalmic, 29*l.* 3*s.* 4*d.*; National Orthopædic, 75*l.* 16*s.* 8*d.*; Royal Orthopædic, 40*l.* 16*s.* 8*d.*; Hospital for Diseases of the Skin, 35*l.*; St. Peter's, for Stone, 35*l.*; Hospital for Diseases of the Throat, 102*l.* 18*s.*; London Homœopathic, 250*l.* 16*s.* 8*d.*; Dental, 71*l.* 3*s.* 4*d.*; National Dental, 5*l.* 10*s.* 8*d.* Convalescent hospitals.—Metropolitan Convalescent Institution, 700*l.*; Mrs. Gladstone's, 233*l.* 6*s.* 8*d.*; Mrs. Kitto's, 30*l.* 6*s.* 8*d.*; Mrs. Marshman's, 53*l.* 13*s.* 4*d.*; Mrs. Rusher's 46*l.* 13*s.* 4*d.*; Seaside Convalescent Hospital (Seaford) 58*l.* 6*s.* 8*d.*; St. Andrew's Convalescent Home, Clewer, 156*l.* 11*s.* 4*d.*; St. Mary Magdalene Convalescent Home, 23*l.* 6*s.* 8*d.* Cottage hospitals.—Beckenham, 35*l.*; Bromley, 24*l.* 10*s.*; Wimbledon, 25*l.* 13*s.* 4*d.*

CHRONICLE OF EVENTS AND OCCURRENCES.

Home and Foreign.

From November, 1875, to November, 1876.

1875.

Nov. 9. The foundering of the steam-ship "Pacific," and loss of 158 lives, on the 5th instant, reported in London.
—. The Prince of Wales received the native Princes at Bombay.
10. Heavy rains and floods throughout England.
11. The French Assembly voted in favour of the "scrutin d'arrondissement," by 357, against 326 for the "scrutin de liste," giving a majority of 31 for the Government.
12. The Hon. E. Stanhope's appointment as Parliamentary Secretary of the Board of Trade, and Mr. G. C. Bentinck's appointment as Judge Advocate-General announced.
13. The Right Hon. W. E. Forster elected Lord Rector of Aberdeen University by 377 votes, over 145 for Lord Lindsay.
15. The Championship of the Thames won by Joseph H. Sadler, of Surbiton, by ten lengths, over R. W. Boyd, of Gateshead.
—. High tide on the Thames; serious inundations on south bank.
—. Bank rate reduced from 4 to 3 per cent.
18. Committee formed at the Mansion House to relieve the sufferers from the inundations in the Thames Valley and other districts.
19. Letter received at the Admiralty from Captain Nares, stating that the Arctic Expedition had reached Upernivick on 22nd July.
—. The Prince of Wales visited the Guicowar at Baroda.
21. Great gale on the English coast.
23. The Duke of Buckingham entered on his office as Governor of Madras.
24. The Queen returned to Windsor from Balmoral.
25. The Prince of Wales left Bombay for Ceylon.
—. Sir John Holker sworn in Attorney-General, and Mr. H. S. Giffard, Q.C., Solicitor-General.
—. Relief of Pampeluna by the Spanish troops.
26. Sir James Hannen gave judgment in the St. Leonards Will case in favour of the acceptance of the provisions of the lost will, as described in evidence by Miss Sugden, and of the eight codicils.
—. The *Times* announced that the British Government had resolved to purchase the Khedive's shares in the Suez Canal for four millions sterling.
27. The French Assembly, on the third reading of the Electoral Law, carried the clause containing the Government scheme for the "scrutin d'arrondissement," without a division.
30. The Right Hon. S. Cave appointed to proceed to Egypt on a mission connected with financial questions.
—. Dr. Moffat, Missionary and Independent Minister, lectured in the nave of Westminster Abbey.

Dec. 1. The Egyptian forces took possession of territory belonging to the Sultan of Zanzibar.
—. Henry Wainwright sentenced to death for the murder of Harriet Lane, at Whitechapel; and Thomas Wainwright to seven years' penal servitude for being an accessory after the fact.
—. The Albert Memorial Chapel at Windsor opened to the public for the first time.

Dec. 2. The Prince of Wales landed at Colombo.
3. Scheme for the mobilization of the British Army announced.
5. W. M. Tweed escaped from custody.
6. Colliery explosion in the Swaithe main pit, Worsborough Dale, in the Barnsley district, 14 lives lost; and almost simultaneously, an explosion in a mine in Glamorganshire, with a loss of 12 lives.
-. Loss of the German steam-ship "Deutschland," with 60 lives.
9. Commencement of the election of the French Senators.
10. The Prince of Wales landed at Madras.
11. Explosion of dynamite at Bremerhaven, upwards of 80 persons killed and 200 seriously injured.
13. Prince of Wales arrived at Madras.
15. The House of Representatives (U.S.A.) declared by a vote of 332 to 18 against the nomination of any President for a third term.
16. Colliery explosion near Mons, Belgium; 110 lives lost.
—. M. Jules Simon elected a member of the French Academy, in the place of M. de Remusat; and M. Dumas, the chemist, *vice* M. Guizot.
—. Foundation stone of the new Opera House on the Thames Embankment laid by the Duke of Edinburgh.
17. Earl of Derby installed as Lord Rector of Edinburgh University.
18. Sir Henry Elliot, in audience of the Sultan, is assured by His Majesty that the reforms promised will be "punctually and promptly carried out."
21. Conclusion of the elections by the French Assembly of 75 life Senators, 67 being members of the Left.
—. Henry Wainwright hung at Newgate for the murder of Harriet Lane.
22. Training-ship "Goliath" burnt off Grays.
23. The Prince of Wales arrived at Calcutta.
28. Announcement of new peerages:—the Duke of Richmond becoming Duke of Gordon: the Earl of Abergavenny a Marquis; and Messrs. J. R. Ormsby Gore, H. G. Sturt, J. Tollemache, and Sir R. T. Gerard, being created Barons.
30. Bank rate raised from 3 to 4 per cent.
—. New Fugitive Slave Circular issued.
31. The French Assembly elected in 1871 held its last sitting.

1876.

Jan. 1. The Prince of Wales held a Chapter of the Order of the Star of India at Calcutta.
3. The "Warspite" training-ship destroyed by fire.
-. Admission to the Crystal Palace reduced to sixpence for Mondays throughout the year.
4. Lord Northbrook resigned the office of Viceroy of India.
-. Lord Penzance, as Dean of the Arches, held his first sitting to try cases under the Public Worship Regulation Act.
-. Dense fog in London, the darkness at noon being total at the West End.
6. Bank rate raised from 4 to 5 per cent.
-. The Grattan statue unveiled in Dublin.
8. Fatal railway accident at Odessa; 68 deaths.
10. Inauguration of the Catholic University at Paris.
—. Lieutenant Cameron's report of his journey of 3,000 miles across the African continent—from opposite Zanzibar to St. Paul de Loando—read at the Royal Geographical Society.
11. The Prince of Wales arrived at Delhi.
13. Marshal MacMahon published a proclamation to the French nation in reference to the approaching general election.
18. Defeat of the Turks in the Herzegovina.

Jan. 21. Railway accident at Abbots Ripton; 15 deaths.
—. Severe snowstorm throughout England.
22. The Royal Aquarium at Westminster opened by the Duke of Edinburgh.
27. Bank rate reduced from 5 to 4 per cent.
30. The Senatorial elections in France give the Republicans a small majority.
31. Count Andrassy's note calling for reforms in Turkish administration presented to the Porte by the Austrian, Russian, and German Ambassadors.

Feb. 2. Meeting of working men at Exeter Hall to condemn the high price of meat.
3. Lord Penzance gave his first judgment under the Public Worship Regulation Act in the Folkestone ritual case.
-. Funeral of Francis Deak at Pesth, with a procession four miles long, including the Archduke Joseph, Count Andrassy, and the Prime Minister and other members of the Cabinet.
6. The Princess of Wales and her children arrived at Dover on their return from Denmark.
8. Third session of the ninth Parliament of Queen Victoria opened by Her Majesty in person. The address to Her Majesty was moved by the Earl of Aberdeen, and seconded by the Earl of Ellesmere, in the House of Lords; and, in the House of Commons, by Mr. Ridley and Mr. Mulholland.
10. The Court of Common Council of the city of London resolved to subscribe for ten free scholarships in the National Training-school for Music, at 40*l.* per annum each for five years.
11. Remarkable fog in London.
12. Order in Council for the re-organization of the lower grades of the Civil Service, on the basis recommended by the Playfair Commission, published in the *London Gazette*.
13. The Prince of Wales sailed from Bombay for England in the "Serapis."
14. Meeting at Exeter Hall, presided over by Professor Fawcett, to protest against the new Government Slave Circular.
15. The King of Spain opened the Cortes, announcing in his speech that the Carlist cause had become hopeless, and that the integrity of Cuban territory would be respected.
16 The Judicial Committee of the Privy Council condemned in costs Mr. Cook, Vicar of Christ Church, Clifton, for refusing to administer the Communion to Mr. Jenkins, on the ground that he held heretical opinions.
—. Mr. Hurst, member for Horsham, unseated on petition.
17. The Royal Titles Bill introduced in the Commons by Mr. Disraeli.
—. Collision in the English Channel between the "Strathclyde" and "Franconia;" more than 30 lives lost.
—. Mr. Jacob Bright returned for Manchester, by a majority of 1,785 over Mr. F. S. Powell, the Conservative candidate.
—. Deputation from the friends of voluntary schools waited on the Lord President of the Council to urge the necessity for affording some increased relief to such schools.
—. The Merchant Shipping Bill read a second time in the Commons without a division.
20. Elections to the French Chamber of Deputies; M. Buffet rejected by five constituencies, and placed his resignation in Marshal MacMahon's hands.
21. The purchase-money for the Khedive's Suez Canal shares voted in the House of Commons without a division.
23 Russian troops entered Khokand.

Feb. 24. M. Buffet handed over the direction of the Home Office to M. Dufaure, and left Paris.
28. Close of the Carlist War; Don Carlos and his Staff entered French territory.

March 1. The Navy Estimates for 1876-77 issued; the total sum required being 11,288,872*l.*, an increase of 463,678*l.* on last year.
2. Reception of M. John Lemoinne, of the *Débats*, on his election to the French Academy.
3. Mr. Osborne Morgan's resolution on the burials question rejected in the House of Commons by 279 to 248.
5. Don Carlos arrived in London.
—. Second ballot and conclusion of the French elections.
6. The Duke and Duchess of Edinburgh left Dover for Russia.
7. The Queen opened the Grocers' Company's wing at the London Hospital.
—. Mr. R. D. B. Morier, C.B., succeeded Lord Lytton as Minister at Lisbon.
8. The Prince Consort's statue on the Albert Memorial unveiled.
—. The newly elected French Chambers met for the first time at Versailles. M. Jules Grévy elected President of the Assembly, by 414 out of 433 votes.
9. Mr. Belknap, the Secretary for War in the United States, brought up at a New York police court on a charge of appropriation of public money.
—. Lady Augusta Stanley buried in Henry the Seventh's chapel, Westminster Abbey; the Queen, the Marchioness of Lorne, and the Princess Beatrice, being present at the service.
—. The freedom of the city of London conferred upon Lord Chief Justice Cockburn.
—. Mr. Disraeli announced to the House of Commons that the title assumed by Her Majesty under the Royal Titles Bill would be "Empress of India."
11. The Prince of Wales arrived at Bombay, and embarked on board the "Serapis," on his return to England.
—. Landslip at Caub, on the Rhine; 26 persons killed.
12. Snowstorm and gale all over England.
—. The Duc d'Audiffret-Pasquier elected President of the French Senate, by 205 out of 274 votes.
14. Opening of the new public Library in the Collegio Romano, named after King Victor Emmanuel; and festival in honour of His Majesty's 56th birthday.
16. The Marquis of Hartington's amendment on the Royal Titles Bill, declaring it to be inexpedient for the Queen to adopt the title of Empress, rejected by the House of Commons, and the second reading of the Bill carried by 305 to 200.
17. Eruption of Mount Vesuvius.
—. Letter from the Prince of Wales to Lord Northbrook, expressing satisfaction at His Royal Highness's reception in India, published officially at Calcutta.
18. Northumberland Avenue, from Charing Cross to the Victoria Embankment, opened to the public.
20. King Alphonso made his entry into Madrid on the close of the Carlist War.
21. Explosion of dynamite at Blaen Llanir, South Wales; upwards of 15 deaths.
22. Yellow fever epidemic at Rio de Janeiro, the deaths averaging between 50 and 60 a day.
23. Bank rate reduced to 3½ per cent.
—. Mr. R. Banner Oakley, Manager of the Co-operative Credit Bank, committed for trial on a charge of fraud.

March 24. The abolition of the state of siege agreed to without discussion by the French Chamber of Deputies.
25. The Prince of Wales arrived at Suez on his return from India.
27. The Queen left London for Germany.
28. Reports received of massacre of Christians by the Turks.
30. The Royal Titles Bill read a second time in the Lords.

April 2. Lieutenant Cameron, the African explorer, arrived in England.
3. Sir Stafford Northcote introduced the budget in the House of Commons, providing for the increase of the income-tax to 3*d*., and the exemption of incomes below 150*l*., and the extension of incomes on which abatement is allowed to 400*l*.
5. Accident to ferry-boat at Aberdeen; 32 lives lost.
6. Prince of Wales arrived at Malta.
7. Lord Lytton, the new Viceroy of India, arrived at Bombay.
-. Royal Titles Bill read a third time and passed in the Lords.
8. The University boat-race won by Cambridge by four lengths.
11. The Prince of Wales left Malta for Gibraltar.
12. The High Court of Justice at Athens condemned and sentenced several ex-Ministers and Bishops for simony and corruption.
—. Lord Lytton assumed the office of Viceroy at Calcutta.
13. Severe snowstorm in England and France.
—. Riots at Barbadoes.
15. The Prince of Wales arrived at Gibraltar.
18. Strike of 20,000 men in the South Yorkshire and Derbyshire coal districts.
—. Commencement of disturbances in Barbadoes.
20. Bank rate reduced to 2 per cent.
21. Death of Mr. C. Bravo, Barrister, at Balham, from antimonial poisoning.
23. The Egyptian War with Abyssinia closed.
25. Dedication and opening of the chapel of Keble College, Oxford.
—. The Prince of Wales arrived at Madrid.
26. The Women's Disabilities Removal Bill thrown out in the Commons, by 239 to 152.
27. The ironclad "Inflexible" launched at Portsmouth; the Princess Louise christening the vessel for the Queen.
28. Proclamation in London of the Queen's adoption of the title of Empress of India.

May 1. The Rev. Dr. L. G. Mylne consecrated Bishop of Bombay.
-. The Prince of Wales arrived at Lisbon.
4. Verdict of wilful murder against four of the "Lennie" mutineers.
6. The French and German Consuls at Salonica assassinated by the Turks during a riot.
8. The Ambassadors of France and Germany demanded satisfaction from the Porte for the murder of the French and German Consuls at Salonica.
-. The Merchant Shipping Bill passed through Committee in the Commons.
10. The Philadelphia Centennial Exhibition opened.
11. The Prince of Wales landed at Portsmouth from the "Serapis," on his return from India, and arrived in London, visiting the Royal Italian Opera in the evening.
14. The Prince and Princess of Wales, with the Duke of Edinburgh and Duke of Connaught, attended the afternoon service at Westminster Abbey, and returned thanks for the Prince's safe return from India.
17. The National Training School for Music at South Kensington formally opened by the Dukes of Edinburgh and Connaught.
18. A second inquiry into the death of Mr. Bravo ordered by the

Home Secretary, owing to doubts raised as to his having been poisoned.

May 19. Banquet and ball at the Guildhall in honour of the Prince of Wales.

22. The refusal of the Government to release the Fenian prisoners announced.

23. Execution of four of the "Lennie" mutineers.

26. Gainsborough's picture of the Duchess of Devonshire, stolen from Messrs. Agnew's gallery.

27. Handel's Dettingen *Te Deum* sung at St. Paul's Cathedral, with full orchestra at a Thanksgiving Service for the return of the Prince of Wales.

—. The Duke of Edinburgh left Portsmouth for the Mediterranean, in command of Her Majesty's ship "Sultan."

30. Deposition of the Turkish Sultan Abdul Aziz, and succession of Mourad Effendi.

—. Great fire at Quebec, upwards of 1,000 houses destroyed.

June 1. Sir Salar Jung arrived on a visit to England.

3. The new buildings of the National Gallery handed over to the Government.

4. The ex-Sultan Abdul Aziz committed suicide.

7. Turks defeated in Bosnia.

14. M. Loyson (Père Hyacinthe) lectured in London on "The Prospects of Christendom."

21. Degree of D.C.L. conferred on Prince Leopold at Oxford.

22. Verdi's *Aida* produced at the Royal Italian Opera, Covent Garden.

26. Debates in both Houses on the Turkish atrocities in Bulgaria.

29. Re-opening of Choir of Exeter Cathedral on completion of the restoration.

—. Statement of Lord Derby and Mr. Disraeli as to the impending war between Servia and Turkey.

—. Mr. E. J. Poynter, Sir J. Gilbert, and Mr. G. D. Leslie, elected Royal Academicians.

30. Mr. Butt's "Home Rule" motion rejected by 291 to 61 in the House of Commons.

—. A Committee on intemperance appointed in the House of Lords on the motion of the Archbishop of Canterbury.

July 1. Review of the Volunteers in Hyde Park by the Prince of Wales.

2. The Servians and Montenegrins crossed the Turkish frontier.

3. Engagement between the Turks and the Servians.

4. Christ Church, Westminster Road, built for Mr. Newman Hall's congregation from the Surrey Chapel (Rowland Hill's), opened.

8. Hampton Court Bridge thrown open free of toll.

11. Opening of the second inquest in the Bravo case.

—. Mr. Edward Pierrepoint presented his credentials to the Queen as Minister from the United States.

12. The King of Greece invested with the Order of the Garter by the Queen.

13. The use of the Russian language made obligatory in the part of Poland belonging to the Muscovite Empire.

14. Boiler explosion on board Her Majesty's ship "Thunderer;" 15 killed and 56 injured.

20. The Edinburgh Court of Session awarded Mr. Charles Reade 90*l.* damages against the *Glasgow Herald* for infringement of copyright for reprinting his tale, "A Hero and a Martyr," from the *Pall Mall Gazette*.

21. The French Senate rejected the Government University Bill by 144 to 139.

July 25. Sir Salar Jung presented with the freedom of the City of London.
29. The Education Bill passed through Committee in the Commons.
31. Debates in Parliament on the Eastern question.
Aug. 5. The Education Bill read a third time in the Commons.
7. Saitschar evacuated by the Servians.
8. The Education Bill read a second time in the Lords.
—. Re-opening of Chester Cathedral after restoration.
9. Conclusion of the examination of witnesses in the Bravo case.
—. The new rooms at the National Gallery thrown open to the public.
10. The Education Bill passed through Committee in the Lords.
11. Seven of the Guardians of Keighley arrested for contempt of Court, in refusing to enforce the provisions of the Vaccination Act.
—. Speech of Mr. Disraeli in the House of Commons on the Bulgarian atrocities.
—. Inquest in the Bravo case concluded; verdict of wilful murder, with a declaration that the evidence is not sufficient to fix the guilt on any person or persons.
—. Issue of the third Slave Circular.
—. The publication of the *Hour* discontinued with this day's issue.
12. Mr. Disraeli accepted the office of Lord Privy Seal.
—. Richard Banner Oakley, Manager of the Co-operative Credit Bank, sentenced to five years' penal servitude for fraud.
13. Opening of the Bayreuth theatre, and first performance of Wagner's Trilogy.
—. Excessive heat in London, the thermometer at 96, being three degrees higher than at any period during the last sixteen years.
14. Mr. J. G. Noel, M.P., gazetted Chief Commissioner of Works, *vice* Lord H. Lennox.
—. Reward of 250*l.* offered by the Crown for the discovery of the murderer of Mr. Bravo.
15. Parliament prorogued; the work of the session included 81 public Acts, 234 local, and 2 private.
16. The National Society for the Aid of Sick and Wounded in Time of War voted 20,000*l.* for the relief of the sufferers by the war in Eastern Europe.
17. The Albert Memorial at Edinburgh unveiled by the Queen.
—. The Hon. T. F. Fremantle issued his address as Conservative candidate for Mr. Disraeli's seat.
18. The proclamation of the Queen's title as Empress of India, published by Lord Lytton in the *Gazette of India*.
—. Mr. Disraeli's elevation to the peerage as Viscount Hughenden and Earl of Beaconsfield gazetted.
—. The King of Dahomey seized a number of Europeans.
20. Great battle between the Turks and the Servians at Alexinatz.
22. Publication of the farewell address of Mr. Disraeli to the electors of Bucks, on his retirement from the seat which he had held since 1847.
—. Hon. R. Carington came forward as Liberal candidate for Bucks.
—. The German ironclads left Salonica, the Emperor's Government being satisfied with the reparation made by the Porte for the outrages.
24. Strike of upwards of 1,600 miners in the Bolton district against a reduction of wages.
25. Negotiations for peace between Servia and Turkey opened by the Representatives of the great Powers at Constantinople.

Aug. 28. Defeat of the Servians by the Turks at Alexinatz.
30. Professor Macfarren's oratorio "The Resurrection" produced at the Birmingham festival.
—. Verdict of accidental death returned in the case of the "Thunderer" explosion.
31. Deposition of Murad V, and proclamation of Abdul Hamid as Sultan of Turkey.

Sept. 1. The first municipal election held in Calcutta.
–. Marquis of Mantegazza sentenced to eight years' imprisonment for forging the King of Italy's name to bills.
3. Great fire at St. Hyacinthe, Canada; four streets destroyed.
4. The great Powers presented to the Porte a request for an armistice.
5. Viscount Bury raised to the peerage as Baron Ashford.
6. Publication of Mr. Gladstone's pamphlet on "Bulgarian Horrors and the Question of the East."
–. The British Association commenced its 46th annual meeting at Glasgow, the inaugural address being given by Professor F. Andrews.
–. Destruction by Commodore Hewett of three villages occupied by piratical tribes on the Niger reported.
7. Investiture of the new Sultan of Turkey with the Sword of Osman.
8. Arrest of William Tweed at Vigo.
9. Mr. Gladstone addressed a meeting at Blackheath on the Eastern question.
11. The "Dandenong" steam-ship foundered on its way from Melbourne, near Jervis Bay; 60 lives lost.
13. Severe shock of earthquake at Sicily, lasting thirty seconds.
15. Twenty-seven deaths from yellow fever on this day at Savannah.
17. Convention of the Chinese Government with the English in respect to the Yunnan outrage signed at Pekin; and an Envoy, with a despatch regretting Mr. Margary's murder, and affirming the right of foreigners to travel and enjoy protection, dispatched to England.
18. Dr. Herzog consecrated at Rheinfelden by Bishop Reinkens, as first bishop of the Swiss Christian Catholic Church.
19. Mr. Baring's report on the atrocities in Bulgaria published in a supplement to the *London Gazette*.
20. Lord Beaconsfield addressed his late constituents at Aylesbury on the Eastern question.
21. The Hon. T. F. Fremantle, the Conservative candidate for Bucks, in the vacancy caused by Mr. Disraeli's elevation to to the peerage, returned by a majority of 186 votes.
24. Hellgate blown up, and the seven years' work of opening a navigable passage for ocean steamers from Long Island into New York harbour completed.
26. The adhesion of all the great Powers to the English proposal as to the terms of peace between Turkey and Servia announced. The Servian Government refused to agree to the proposal of the Porte that hostilities should be suspended for eight days longer.
27. The Court of Common Council voted, by 69 to 45, in favour of the removal of Temple Bar.
—. Public Health Congress opened in Brussels.
28. Whirlwind in the Isle of Wight.
—. The Servians re-commenced the attack on the Turks.
29. Alderman Sir Thomas White elected Lord Mayor of London, in succession to Alderman Cotton, M.P.

Oct. 2. Dr. Slade, the spiritualist, and his assistant, charged at Bow Street Police Court by Professor Ray Lankester with conspiracy to defraud.
3. The Church Congress opened at Plymouth.
5. Count Arnim sentenced to five years' penal servitude for treason, and for calumniating the Emperor and Prince Bismarck.
11. The Social Science Congress opened at Liverpool, with an address by the Marquis of Huntley.
—. The Turkish Government offered to grant a six months' armistice to Servia.
13. Queen Isabella arrived at Madrid.
14. Great increase of small-pox in London. The Metropolitan Asylums Board decided to convert the asylum for imbeciles at Hampstead into a small-pox hospital.
—. Announcement of the Duke of Marlborough's appointment as Viceroy of Ireland, in the room of the Duke of Abercorn.
17. The Prince of Wales laid the first stone of the new Post Office at Glasgow.
19. Mr. J. E. Sandys elected public orator at Cambridge.
20. The Turks surrendered Medun to the Montenegrins, after a blockade of four months.
28. The Rev. J. Porter elected Master of St. Peter's College, Cambridge, in succession to the late Dr. Cookson.
29. The Servians totally defeated, and Djunis captured by the Turkish army.
—. The Arctic vessels, H.M.S. "Alert" and H.M.S. "Discovery," arrived in Cork Harbour.
31. Russian ultimatum demanding the signing of an armistice within 48 hours presented to the Porte.
—. Alexinatz taken by the Turks.
—. Slade, the spiritualist, sentenced to three months' imprisonment under the Vagrancy Act; but on notice of appeal being given, he was released on bail.

Nov. 1. The Turks occupied Deligrad.
—. An eight weeks' armistice between Turkey and Servia signed.
—. Opening of the North Sea Canal by the King of Holland.
2. The new Judges, Messrs. Hawkins and Manisty, took their seats in Court.
—. The Arctic vessels arrived at Portsmouth.
4. Dr. Atkinson, Master of Clare College, elected Vice-Chancellor of Cambridge University, in succession to Dr. Phear.
6. Sir M. Hicks-Beach, Bart., Chief Secretary for Ireland, appointed a Cabinet Minister.
7. The Marquis of Salisbury appointed as Special Ambassador from the Queen at the Conference at Constantinople on the Eastern question.
9. Sir Thomas White entered on his office as Lord Mayor of London.
10. Lord-Advocate Watson returned as Member for the Glasgow and Aberdeen Universities.
—. The Philadelphia Exhibition closed by President Grant.
13. Appointment of Cardinal Simeoni as Pontifical Secretary of State, in succession to Cardinal Antonelli, announced at Rome.
—. The Turkish troops withdrawn from the entire frontier.
16. Great meeting at St. James's Hall in the interests of religious education.

NECROLOGICAL TABLE

OF DISTINGUISHED AND NOTABLE PERSONS WHO DIED BETWEEN NOVEMBER, 1875, AND NOVEMBER, 1876.

1875.		Age
Nov.	1. LYCURGUS, Alexander, Archbishop of Syra and Tenos; at Athens.	50
	4. VON MOHL, Dr. Robert, Professor of Civil Law; at Berlin	
	—. WILLIAMS, Rt. Hon. Sir E. V., for 30 years Judge of the Common Pleas; at Westminister	78
	8. JONES, Rev. Thomas, A.M., for 62 years Chaplain of the Chapel Royal, Whitehall; at Enfield	95
	9. NORTH, Brownlow, Registrar of the Diocese of Winchester, Lay Preacher; at Dumbarton, N.B.	65
	12. SANDERS, William, F.R.S., geologist; at Clifton	76
	13. BROCK, Rev. William, D.D., Baptist Minister, author of a "Life of Havelock," etc.; at St. Leonards.	68
	17. VIGNOLES, Charles B., F.R.S., civil engineer; at Hythe, Hants	82
	18. FEARON, Rev. Daniel R., Vicar of St. Marychurch; at Torquay	72
	21. FRANCIS, Archduke, ex-Duke of Modena; at Vienna	56
	22. WILSON, Henry, Vice-President of the United States; at Washington.	64
	23. HOUGHTON, A. B., artist and wood draughtsman; at King Henry's Road, Regent's Park	39
	24. RAUSCHER, Cardinal, Prince Archbishop of Vienna; at Vienna.	
	—. ASTOR, W. B., reputed to be the greatest capitalist in America; at New York	
	25. HARRISON, Mary, flower and fruit painter; at Hampstead	87
	27. FORDYCE, William Dingwall, M.P. for East Aberdeenshire; at Bruckley Castle	39
	—. SCHNEIDER, M., President of the Corps Legislatif under the Empire; at Paris	69
	28. DITCHER, Rev. Joseph, for 34 years Vicar of South Brent, prosecutor in the case of Ditcher *v.* Denison; at Brent	82
	29. KEY, Thomas Hewitt, M.A., F.R.S., Head Master of University College School, London, and Professor of Comparative Grammar in the College; at Westbourne Square	76
	30. JONES, Thomas, B.A., F.S.A., for 30 years Librarian of the Chetham Library at Manchester; at	65
	—. KOPP, Emile, Professor of Chemistry; at Zurich	58
Dec.	1. DEJAZET, Virginie, actress, said to be the oldest actress in the world; at Paris	77
	—. CARRINGTON, R. C., F.R.S., astronomer; at Churt, near Farnham	47
	2. SEDILLOT, French Orientalist	68
	3. CUNNINGHAM, Lieut.-Col. Francis, editor of "Ben Jonson," etc.; at Kensington	55
	4. HEADLAM, Rt. Hon. T. E., formerly M.P. for Newcastle-on-Tyne, Judge Advocate-General from 1859 to 1866, and Chancellor of the Dioceses of Durham and Ripon; at Calais	62
	5. BAIRD, Rev. W., M.A., Vicar of Homerton; at Coleshill Street, Pimlico	39

		Age
Dec.	6. FITZWALTER, Lord (Brook William Bridges), formerly M.P. for East Kent; at Goodnestone	74
	10. STEWART, Sir Houston, G.C.B., Admiral of the fleet; at Portwilliam, Wigtonshire	84
	13. DOUGLAS, Rt. Rev. Henry Alexander, D.D., Bishop of Bombay; at Maida Vale	54
	15. PEARS, Rev. Steuart Adolphus, D.D., late Head Master of Repton; at Childrey	60
	16. LUNDGREN, E., painter, "the artist of the Indian Mutiny," his sketches having been made while with the staff of Lord Clyde; at Stockholm.	59
	17. MOWBRAY, Alfred Richard, publisher; at Oxford.	51
	22. WETHERELL, N. T., geologist, member of the "London Clay Club;" at Highgate	75
	23. SAINT GEORGES, Marquis de, librettist and author; at Paris.	74
	—. LA GUERRONIERE, Arthur, Vicomte de, Councillor of State under the Empire, manager of the *Presse;* at Paris	59
	24. STANHOPE, Earl (Philip Henry Stanhope), historian; at Bournemouth	70
	25. KEENE, James, for fifty years editor and proprietor of the *Bath Journal;* at Bath.	80
	26. LAFITTE, Charles, Financier; at Paris.	
	28. DYMOKE, Henry Lionel, "Her Majesty's Champion;" at South Kensington	42
	—. BOEHM, Henry, the oldest minister of the Methodist Church in America; at New York	100
	30. WALEY, Simon M., musical amateur and composer; in London.	48
1876.		
Jan.	4. DE MOHL, Jules, Orientalist; at Paris.	75
	—. DE ROTHSCHILD, Sir Anthony, banker; at Southampton	65
	6. SOTHERON-ESTCOURT, Rt. Hon. T. H., formerly M.P. for North Wilts, some time Home Secretary and late President of the Poor Law Board; at Tetbury	74
	8. TWESTEN, Dr., theologian; at Berlin	86
	9. AMBERLEY, Viscount, M.P. for Nottingham 1866–68, author of an Analysis of Religious Belief; at Enscroft, Chepstow	33
	11. GIBBONS, Sir Sills John, Bart., Lord Mayor of London in 1871, also Sheriff in 1865, and Alderman 1862-75; at Hastings	66
	15. DEAS, Sir David, K.C.B., Inspector-General, R.N., Chief Medical Officer of the Naval forces during the Russian War, and in the Chinese War up to the peace of Tientsin; at Edinburgh	68
	17. GASTINEAU, Henry, painter, oldest surviving member of the Water-Colour Society; at Camberwell.	84
	19. SCROPE, George Poulett, F.R.S., F.G.S., for 35 years M.P. for Stroud; at Chobham	78
	21. MARGARY, Major-General, R.E., served in the Mahratta campaign, and in the War in Affghanistan; at Weston-super-Mare	65
	22. HARVEY, Sir W. George, President of the Royal Scottish Academy; at Edinburgh	70
	—. DYKES, Rev. John B., M.A., Mus. Doc., composer of Church Music	52
	—. CALLENDER, Wm. Romaine, M.P. for Manchester; at St. Leonards, Sussex.	50
	24. DUMBRECK, Sir David, K.C.B., M.D., Inspector-General of Hospitals, Principal Medical Officer of the British Army in the Crimean War; at Florence	75

		Age
Jan.	26. LEMAITRE, Frederick, actor; at Paris	78
	28. DEAK, Francis, Hungarian Statesman; at Pesth	73
	29. BARROW, William Hodgson, M.P. for South Notts 1851 to 1872; at Southwell	91
	30. GRUNBAUN, Therése, vocalist, for whom Weber wrote the music of "Eglantine" in "Euryanthe;" at Berlin	80
	31. BURNS, Jabez, D.D., LL.D., Temperance Advocate; at Paddington	70
Feb.	1. FORSTER, John, author of the memoir of Charles Dickens, formerly editor of the *Examiner* and *Daily News*; at Palace Gate	63
	4. DE GAMOND, Thomé, engineer, originator of the scheme for the submarine tunnel between France and England; at Paris	77
	7. KING, Richard, M.D., Arctic voyager, and founder of the Ethnological Society; at Manchester Street	65
	9. LAURENTIE, M., editor of the *Union*, and one of the oldest French journalists; at Paris	83
	-. TAYLOR, Sir H. G. H., Senior General of the English Army; at Hyde Park Gardens	92
	-. KEATINGE, Rt. Hon. Richard, late Judge of the Irish Court of Probate; at Dublin	82
	10. JOHNSON, the Hon. Reverdy, United States Senator, and formerly Minister to England; at Annapolis	79
	11. COLERIDGE, Rt. Hon. Sir John Taylor, Judge of the Court of Queen's Bench 1835-1858, for some years editor of the *Quarterly Review*, and author of the "Life of Keble," etc.; at Ottery St. Mary	85
	12. WALKER, Sir Baldwin W., Bart., K.C.B., late Surveyor of the Navy; at the Depperhaugh	73
	—. BRISTOW, Edmund, landscape painter; at Eton	80
	13. ANGELIN, Niels Peter, palæontologist; at Stockholm	71
	16. GELDART, Rev. James William, LL.D., from 1813 to 1847 Regius Professor of Civil Law at the University of Cambridge; at Kirk Deighton	91
	17. BUSHNELL, Horace, D.D., theologian; at Hartford, U.S.A.	73
	18. CUSHMAN, Charlotte, actress; at Boston	60
	19. BRONGNIART, Adolphe, Professor of Botany and member of the Institute; at Paris	75
	—. PATIN, M., Permanent Secretary and member of the Academy; at Paris	83
	21. MARIE NICOLAIEVNA, Grand Duchess, sister of the Emperor of Russia; at St. Petersburgh	57
	--. GAUNTLETT, Henry John, Mus. Doc. Cantuar, composer, musical journalist, and organist; at Kensington	70
	22. LAW, Rev. James Thomas, for 53 years Chancellor of the Diocese of Lichfield; at Lichfield	85
	27. BARROW, Sir George, Bart., C.M.G., late Chief Clerk of the Colonial Office; at Kensington	69
	—. HORSLEY, Charles Edward, composer and organist; at New York	50
	28. MAJOR, Rev. John Richardson, D.D., for 36 years Head Master of King's College School, London; at Twickenham	79
	—. FLEMING, Henry, C.B., Permanent Secretary of the Local Government Board; at Charles Street, Berkeley Square	
March	1. STANLEY, Lady Augusta, wife of the Dean of Westminster; at the Deanery	53
	2. PAQUE, G., violoncellist, and member of H.M. Private Band; at Great Portland Street	50

		Age
March 4.	HOLMES, Alfred, violinist and composer; at Paris	39
5.	D'AYOULT, Comtesse ("Daniel Stern"), authoress; in France	71
9.	STRANGE, Lieut.-Colonel Alexander, F.R.S., F.R.A.S.; at Onslow Square	57
11.	MILLER, Lydia, widow of Hugh Miller, authoress and partly editor of her husband's works; at Assynt	64
12.	GAPE, J., Admiral, one of the survivors of Trafalgar; at Kensington	82
15.	MILMAN, Rt. Rev. Robert, D.D., Bishop of Calcutta; at Rawul Pindee	60
15.	PARKES, Edmund Alexander, M.D., F.R.S., Professor of Hygiene at the Medical School at Netley; at Bitterne	56
17.	FREILIGRATH, Ferdinand, poet; at Cannstadt, near Stuttgart	65
19.	VLEMINCKX, Dr., President of the Belgian Academy of Medicine; at Brussels	76
—.	CHESNEY, Charles Cornwallis, Colonel, commanding the Royal Engineers of the Home District, author of military works,; at Victoria Street	49
20.	HALL, Thomas James, Chief Police Magistrate of the Metropolis from 1837 to 1864	87
—.	REDGRAVE, Samuel, editor of the catalogues of the Exhibition of Miniatures in 1865, of the National Portrait Exhibitions, and author of the "Dictionary of Artists of the British School;" at	
22.	SEDLEY, Anthony Gardiner, Lieut-Col., Governor of the Military Knights of Windsor; at Windsor	81
—.	VINCENT, Very Rev. James, Dean of Bangor; at Bangor	83
—.	FISHER, Sir John William, Chief Surgeon to the Metropolitan Police Force from its establishment in 1829 to 1865; at Park Lane	88
—.	M'LACHLAN, Rev. W., the "Father of the Reformed Presbyterian Church;" at Port Glasgow	81
—.	CONWAY, Rev. W., Canon of Westminster; at Dean's Yard	60
23.	PYE, William, Commander R.N., served as Midshipman at Trafalgar, and took part in the fighting; at Dawlish	91
25.	BURROWS, Sir J. Cordy, surgeon, promoter of social and philanthropic institutions; at Brighton	73
29.	LETHEBY, Henry, M.D., Chemical Analyst to the City of London; at	60
31.	MACKENZIE, Right Hon. Holt	89
April 5.	SIMPSON, Richard, M.A., formerly an Anglican Clergyman, who joined the Roman Church with Dr. Newman, sometime editor of the "Rambler;" at Rome	55
6.	DALGAIRNS, Rev. John Bernard, Priest of the Oratory, formerly an Anglican Clergyman; at Brompton	57
9.	STEWART, A. T., millionaire; at New York	73
—.	THORESEN, Thomas Krag, dramatist; at Christiania	
11.	ROBSON, John, B.A., Secretary to the Council of University College, London, and Clerk of Convocation to the University of London; at Hastings	61
17.	BUCHHOLZ, Dr. Remhold, traveller; at Grieswald	40
—.	VIVIAN, Rev. J. W., D.D., Rector of St. Peter-le-Poer, Old Broad Street, Minor Canon of St. Paul's and Priest in Ordinary to the Queen; at Guilford Street	91
18.	LYTTELTON, Lord, Lord Lieutenant of Worcestershire, late Chief Commissioner of Endowed Schools, author; at Park Crescent	59

			Age
April	19.	WESLEY, Samuel, Mus. Doc., organist of Gloucester Cathedral and composer; at Gloucester	66
	—.	WILDE, Sir William, surgeon oculist; at Dublin	71
	21.	WHITTINGHAM, Charles, printer, Chiswick press; at Surbiton	80
	24.	HAYES, Samuel, publisher, formerly of London; at Cambridge	81
	28.	EARLE, Thomas, sculptor; at Vincent Street, Ovington Square	65
	—.	YOUNG, Charles, Peninsular veteran; at Edinburgh	108
	30.	PAYNE, Joseph, Professor of Education at the College of Preceptors; at Kildare Gardens, Bayswater	68
May	4.	ORPEN, Sir Richard J. T., President of the Incorporated Society of Attorneys and Solicitors of Ireland; at Dublin	87
	7.	DAVIS, G. H., LL.D., Secretary of the Religious Tract Society; at Milner Square, Islington	64
	11.	ESQUIROS, Henri Alphonse, author; at Versailles	62
	12.	RICARD, M., Minister of the Interior in M. Dufaure's Cabinet; at Paris.	48
	—.	WYNTER, Andrew, M.D., Physician, editor of the British Medical Journal from 1845 to 1861; at Chiswick	56
	—.	VAN PRINSTERER, Groen, statesman and author; at Amsterdam	75
	21.	BOWLES, General Sir George, G.C.B., Lieutenant of the Tower of London; at Berkeley Street	89
	24.	KINGSLEY, Henry, novelist and journalist; at Cuckfield	46
	—.	ANGEL, Alfred, for 34 years organist of Exeter Cathedral; at Exeter	60
	27.	HOGG, Right Hon. Sir James Weir, Bart., formerly Chairman of the E. I. Company, and M.P. for Beverley and Honiton; at Grosvenor Crescent.	85
	—.	BOSWORTH, Joseph, D.D., F.R.S., Professor of Anglo-Saxon; at Oxford	87
	29.	DIEZ, Friedrich, founder of the Philology of the Romance Languages; at Bonn	81
June	1.	CRICK, Rev. Thomas, B.D., formerly President of St. John's College, Cambridge, and Public Orator of the University; at Staplehurst	75
	—.	APPONYI, Count, diplomatist; at Venice	64
	3.	EADIE, Rev. John, D.D., LL.D., Professor of Theology, United Presbyterian Church, and author; at Glasgow	62
	—.	HAUG, Martin, author of essays on the Parsees; at Ragatz, Switzerland	
	—.	SCOURFIELD, Sir J. H., Bart., M.P.; at St. James's Place	68
	7.	HALL, Rev. Samuel Romilly, Wesleyan Minister, and President of the Conference in 1868; at Bristol.	63
	8.	DUDEVANT, Mdme. (Georges Sand), authoress; at Nohant, France	71
	—.	FEILD, Right Rev. Edward, D.D., Bishop of Newfoundland; at Bermuda	75
	11.	THORNBURY, George Walter, author and journalist	47
	12.	RICHARDS, Alfred Bate, editor of the *Morning Advertiser*, dramatic author, and promoter of the Volunteer movement; at	55
	—.	KELLY, Rev. John, hymn writer, for 45 years a Congregational Minister; at Liverpool	
	16.	HENRY, Sir Thomas, Chief Magistrate, Bow Street Police Court; at Hanover Square	69
	20.	DE SANTA ANNA, Antonio Lopez, ex-President of Mexico; at Vera Cruz	78

		Age
June	20. BAIRD, James, ironmaster, the donor of half a million sterling to the Established Church of Scotland; at Ayr.	73
	23. NAPIER, Robert, shipbuilder; at Glasgow	85
	—. SANDHURST, Lord, General, G.C.S.I.; at Grosvenor Gardens	57
	—. NOBLE, Matthew, sculptor; at Kensington	55
	26. MARTINEAU, Harriet, Authoress; at Ambleside	74
	27. EHRENBERG, Dr. Christian Gottfried, microscopist; at Berlin	80
	30. DE CHATELAIN, Clara, author of the "Sedan Chair," and other works	69
July	1. CHANDLER, Rev. John, hymn writer and translator; at Witley	70
	4. MALDEN, Henry, M.A., one of the founders of London University, and for nearly 45 years Professor of Greek; at Hampstead	75
	6. PERIER, Auguste Casimir, statesman; at Paris	64
	8. DESSAUER, Joseph, composer; at Mödling, near Vienna	78
	9. BEST, the last member of the Master Singers' Guild; at Ulm	86
	10. BARDSLEY, Sir James Lomax, physician; at Manchester	75
	11. RANSFORD, Edwin, vocalist; at Welbeck Street	71
	—. WATERLOW, James, stationer and printer, for 31 years a member of the Corporation of London; at Peckham.	87
	12. BRISSE, Baron, gastronomist; at Fontenay-aux-Roses.	
	17. CONYNGHAM, Marquis, K.P., P.C.; at Hamilton Place	80
	—. DYKE, Francis Hart, Queen's Proctor, etc; at Egham.	73
	—. SIMROCK, Karl, author and professor; at Bonn	74
	18. RUSSEL, Alexander, editor of the *Scotsman;* at Edinburgh.	61
	20. LOWENTHAL, J. J., chess-player and writer on the game; at St. Leonards	66
	21. HAYWARD, Tom, the "All England Cricketer;" at Cambridge	41
	24. MUDIE, Thomas Molleson, pianist and composer; at Shaftesbury Terrace	67
	—. KAYE, Sir John William, K.C.S.I., F.R.S., late Secretary in the Political and Secret Department of the India Office, author of works on India; at Forest Hill	62
	25. CHILDERS, Robert Cæsar, Professor of Pali at London University College; at Clanricarde Gardens	38
	26. DIXON, Elijah, the "Father of English Reformers;" at New Moston.	86
	28. COLLINS, Mortimer, novelist and journalist; at Richmond	49
	29. BUTCHER, Right Rev. Samuel, D.D., Bishop of Meath; at Ardbrackan	64
Aug.	1. MELLIN, Pastor, Swedish novelist and historian; at Norre Wiams	73
	6. RAINY, Harry, M.D., LL.D., Emeritus Professor of Forensic Medicine in Glasgow University; at Glasgow	83
	9. FRANCIS, Sir Philip, Consul-General and Judge of the Supreme Court in the Levant; near Smyrna	
	—. GREEN, Henry, shipowner; at Reigate	69
	10. LANE Edward William, Orientalist; at Worthing	74
	—. FRANCATELLI, Charles Elmé, cook; at Eastbourne	70
	—. BERGMANN, Carl, orchestral conductor, for 20 years leader of the New York Philharmonic Society; at New York, U. S. A.	55
	11. WATTS, Isaac, C.B., late Chief Constructor of the Navy; at Broadstairs	79
	15. LEWIS, J. F., R.A., painter; at Walton-on-Thames	71
	18. MILLER, George James Somerton, sculptor; at Westminster	45

			Age
Aug.	19.	SMITH, George, of the British Museum, Assyriologist and explorer; at Aleppo	36
	20.	NEFFITZER, founder and editor of *Le Temps*; at Basle.	55
	—.	KERR, Michael C., Speaker of the American House of Representatives; at Rockbridge, Virginia	
	21.	RIVIERE, William, artist; at Oxford	69
	22.	PERKINS, George R., LL.D., mathematician; at Utica, U. S. A.	
	24.	CORSER, Rev. Thomas, M.A., F.S.A., bibliophile; at Stand, Manchester	84
	—.	HILDITCH, Sir Edward, M.D., Inspector-General of Hospitals; at Bayswater	71
	25.	TATE, Rev. Dr., President of Ushaw College; at Durham	76
	—.	TIDEMAND, Adolf., painter of *genre* subjects; at Christiania	60
	—.	HOWARTH, Rev. Henry, B.D., for 31 years Rector of St. George's, Hanover Square; at Tunbridge Wells	75
	27.	FROMENTIN, Eugène, painter; at Paris.	55
	29.	PROUT, John Skinner, water-colour painter	69
	—.	DEMERIC, Victor, surgeon, late President of the Medical Society of London; at Brook Street	65
	—.	DAVID, Felicien, composer; at Saint Germain, Paris	66
Sept.	4.	RIDDING, Arthur, M.A., Fellow and Librarian of New College; at Oxford	49
	6.	SMITH, William, F.S.A., art antiquary;	68
	7.	SIBSON, Francis, M.D., F.R.S., Physician; at Geneva	61
	9.	WHITTAKER, J., water-colour painter; at Bettws-y-Coed	
	11.	SEATON, Sir Thomas, K.C.B., General; at Paris	70
	12.	QUAIN, Sir John Richard, Justice of the Queen's Bench; at Cavendish Square	71
	—.	AUERSPERG, Count Anton Alexander ("Anastasius Grün"), poet and statesman; at Graz	70
	18.	LEVEN AND MELVILLE, Earl of; at Dumphail, N.B	89
	—.	LAMBTON, Hedworth, M.P. for North Durham from 1832 to 1847; at Brighton	89
	21.	LAYCOCK, Charles, M.D., Professor of Physic in the University of Edinburgh; at Edinburgh	64
	24.	SHILLETO, Rev. Richard, M.A., Classical Scholar, Fellow of Trinity College; at Cambridge	66
	26.	RIMBAULT, E. F., LL.D., F.S.A., musical historian and antiquarian, organist, and composer; at St. Mark's Crescent, Regent's Park	60
	30.	COOKSON, Rev. Henry Wilkinson, D.D., Master of St. Peter's College; at Cambridge	66
Oct.	2.	COOPER, George, sub-organist of St. Paul's Cathedral, organist of the Chapel Royal, &c.; at	56
	6.	GREEN, Benj. R., water-colour painter; at Clapton	68
	—.	LISGAR, Lord (Sir John Young), Chief Secretary for Ireland 1852-5, Governor of New South Wales 1860-67, and of Canada 1868-72; at Bailieboro', Cavan.	69
	—.	PERTZ, George Henry, late Chief Librarian of the Royal Library of Berlin; at Munich	81
	8.	VENABLES, Addington Peel, D.D., Bishop of Nassau; at Hartford, U.S.A.	49
	10.	TWEEDDALE, Marquis of, K.T., G.C.B., Field-Marshal; at Yester House, Addington	89
	13.	DE BONSCHEN, Arthur, economist and statistician; at St. Petersburgh.	
	15.	BOWSTEAD, J., M.A., late Hon. Inspector of male training colleges in England and Wales; at Stroud, Gloucester	66

		Age
Oct.	18. ARCHIBALD, Hon. Sir T. D., Justice of the Court of Common Pleas; at Porchester Gate	59
	25. FREDERICK, Prince of Hesse; at Rumpenheim	86
	26. HEMANS, Charles Isidore, historian and archæologist; at Lucca	
	28. STUART, Right Hon. Sir John, Vice-Chancellor 1852-1871; at Queen's Gate	83
Nov.	5. HEUGLIN, Theodore, African Traveller; at Stuttgard	52
	6. ANTONELLI, Giacomo, Cardinal Pontifical Secretary of State; at Rome	70
	7. WADDY, Rev. Samuel Dousland, D.D., ex-President of the Wesleyan Conference, and for many years Principal of Wesley College, Sheffield; at Bristol	72
	8. MARIA VICTORIA, Duchess of Aosta, wife of Prince Amadeo, ex-King of Spain; at San Remo	28
	9. TAMBURINI, Antonio, operatic artist; at Nice	76
	—. BELL, Lady, widow of Sir Charles Bell, Surgeon, and editor of his "Letters;" at Albany Street	89
	10. JENKINS, Rev. John David, D.D., Canon of Maritzburg, Fellow of Jesus College, Oxford; at Aberdare	48
	12. HERRIES, Lord (William Constable Maxwell); at Berkeley Square	72

NOTE.—The Necrological Table here given contains the names of 231 distinguished persons, of various countries, who died during the twelve months from the commencement of November, 1875, to the commencement of November, 1876. Of this number, 50, or more than 21 per cent., died at the age of 80 or more, and of these, eight were upwards of 90, one having reached the age of 100, and another, a Peninsular veteran, who died at Edinburgh, being returned as 108.

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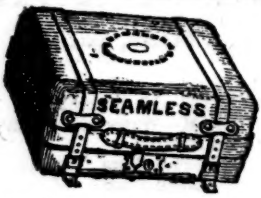

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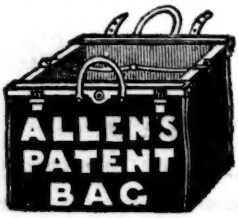

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INDIGESTION is a weakness or want of power of the digestive juices in the stomach to convert what we eat and drink into healthy matter, for the proper nourishment of the whole system. It is caused by everything which weakens the system in general, or the stomach in particular. From it proceed nearly all the diseases to which we are liable; for it is very certain that if we could always keep the stomach right we should only die by old age or accident. Indigestion produces a great variety of unpleasant sensations; amongst the most prominent of its miserable effects are a want of, or an inordinate appetite, sometimes attended with a constant craving for drink, a distension or feeling of enlargement of the stomach, flatulency, heartburn, pain in the stomach, acidity, unpleasant taste in the mouth, perhaps sickness, rumbling noise in the bowels; in some cases of depraved digestion there is nearly a complete disrelish for food, but still the appetite is not greatly impaired, as at the stated period of meals persons so afflicted can eat heartily, although without much gratification; a long train of nervous symptoms are also frequent attendants, general debility, great languidness, and incapacity for exertion. The minds of persons so afflicted frequently become irritable and desponding, and great anxiety is observable in the countenance; they appear thoughtful, melancholy, and dejected, under great apprehension of some imaginary danger, will start at any unexpected noise or occurrence, and become so agitated that they require some time to calm and collect themselves; yet for all this the mind is exhilarated without much difficulty; pleasing events, society, will for a time dissipate all appearance of disease; but the excitement produced by an agreeable change vanishes soon after the cause has gone by. Other symptoms are, violent palpitations, restlessness, the sleep disturbed by frightful dreams and startings, and affording little or no refreshment; occasionally there is much moaning, with a sense of weight and oppression upon the chest, nightmare, &c.

It is almost impossible to enumerate all the symptoms of this first invader upon the constitution, as in a hundred cases of *Indigestion* there will probably be something peculiar to each; but be they what they may, they are all occasioned by the food becoming a burden rather than a support to the stomach; and in all its stages the medicine most wanted is that

OBSERVATIONS ON INDIGESTION.

which will afford speedy and effectual assistance to the digestive organs, and give energy to the nervous and muscular systems—nothing can more speedily or with more certainty effect so desirable an object than *Norton's Extract of Camomile Flowers*. The herb has from time immemorial been highly esteemed in England as a grateful anodyne, imparting an aromatic bitter to the taste, and a pleasing degree of warmth and strength to the stomach, and in all cases of indigestion, gout in the stomach, windy colic, and general weakness, it has for ages been strongly recommended by the most eminent practitioners as very useful and beneficial. The great, indeed only, objection to its use has been the large quantity of water which it takes to dissolve a small part of the flowers and which must be taken with it into the stomach. It requires a quarter of a pint of boiling water to dissolve the soluble portion of one drachm of Camomile Flowers; and when one or even two ounces may be taken with advantage, it must at once be seen how impossible it is to take a proper dose of this wholesome herb in the form of tea: and the only reason why it has not long since been placed the very first in rank of all restorative medicines is, that in taking it the stomach has always been loaded with water which tends in a great measure to counteract, and very frequently wholly to destroy the effect. It must be evident that loading a weak stomach with a large quantity of water, merely for the purpose of conveying into it a small quantity of medicine, must be injurious; and that the medicine must possess powerful renovating properties only to counteract the bad effects likely to be produced by the water. Generally speaking, this has been the case with Camomile Flowers, a herb possessing the highest restorative qualities, and when properly taken, decidedly the most speedy restorer, and the most certain preserver of health.

NORTON'S CAMOMILE PILLS are prepared by a peculiar process accidentally discovered, and known only to the proprietor, and which he firmly believes to be one of the most valuable modern discoveries in medicine, by which all the essential and extractive matter of more than an ounce of the flowers is concentrated in four moderate-sized pills. Experience has afforded the most ample proof that they possess all the fine aromatic and stomachic properties for which the herb has been esteemed; and, as they are taken into the stomach unencumbered by any diluting or indigestible substance, in the same degree has their benefit been more immediate and decided. Mild in their operation and pleasant in their effect, they may be taken at any age, and under any circumstances, without danger or inconvenience. A person exposed to cold and wet a whole day or night could not possibly receive any injury from taking them, but on the contrary, they would effectually prevent a cold being taken. After a long acquaintance with and observance of the medicinal properties of *Norton's Camomile Pills*, it is only doing them justice to say, that they are really the most valuable of all TONIC MEDICINES. By the word tonic is meant a medicine which gives strength to the stomach sufficient to digest in proper quantities all wholesome food, which increases the power of every nerve and muscle of the human body, or in other words, invigorates the nervous and muscular systems. The solidity or firmness of the whole tissue of the body, which so quickly follows the use of *Norton's Camomile Pills*, their certain and speedy effect in repairing the partial dilapidations from time or intemperance, and their lasting salutary influence on the whole frame, is most convincing, that in the smallest compass is contained the largest quantity of the tonic principle, of so peculiar a nature as to pervade the whole system, through which it diffuses health and strength sufficient to resist the formation of disease, and also to fortify the constitution against contagion; as such, their general use is strongly recommended as a preventative during the prevalence of malignant fever or other infectious diseases, and to persons attending sick-rooms they are invaluable, as in no one instance have they ever failed in preventing the taking of illness, even under the most trying circumstances.

As *Norton's Camomile Pills* are particularly recommended for all stomach complaints or indigestion, it will probably be expected that some advice will be given respecting diet, though after all that has been written upon the subject, after the publication of volume upon volume, after the country has, as it were, been inundated with practical essays on diet as a means of prolonging life, it would be unnecessary to say more, did we not feel it our duty to make the humble endeavour of inducing the public to regard them not, but to adopt that course which is dictated by nature, by reason, and by common sense. Those persons who study the wholesomes, and are governed by the opinion of writers on diet, are uniformly both unhealthy in body and weak in mind. There can be no doubt that the palate is designed to inform us what is proper for the stomach. and of course that must best instruct us what food to take and what to avoid: we want no other adviser. Nothing can be more clear than those articles which are agreeable to the taste were by nature intended for our

OBSERVATIONS ON INDIGESTION.

food and sustenance, whether liquid or solid, foreign or of native production; if they are pure and unadulterated, no harm need be dreaded by their use; they will only injure by abuse. Consequently whatever the palate approves, eat and drink always in moderation, but never in excess; keeping in mind that the first process of digestion is performed in the mouth, the second in the stomach; and that, in order that the stomach may be able to do its work properly, it is requisite the first process should be well performed; this consists in masticating or chewing the solid food, so as to break down and separate the fibres and small substances of meat and vegetable, mixing them well, and blending the whole together before they are swallowed; and it is particularly urged upon all to take plenty of time to their meals and never eat in haste. If you conform to this short and simple, but comprehensive advice, and find that there are various things which others eat and drink with pleasure and without inconvenience, and which would be pleasant to yourself only that they disagree, you may at once conclude that the fault is in the stomach, that it does not possess the power which it ought to do, that it wants assistance, and the sooner that assistance is afforded the better. A very short trial of medicine will best prove how soon it will put the stomach in a condition to perform with ease all the work which nature intended for it. By its use you will soon be able to enjoy, in moderation, whatever is agreeable to the taste, and unable to name one individual article of food which disagrees with or sits unpleasantly on the stomach. Never forget that a small meal well digested affords more nourishment to the system than a large one, even of the same food when digested imperfectly. Let the dish be ever so delicious, ever so enticing, a variety offered, the bottle ever so enchanting, never forget that temperance tends to preserve health, and that health is the soul of enjoyment. But should an impropriety be at any time, or ever so often committed, by which the stomach becomes overloaded or disordered, render it immediate aid by taking a dose of *Norton's Camomile Pills*, which will so promptly assist in carrying off the burden thus imposed upon it that all will soon be right again.

It is most certainly true that every person in his lifetime consumes a quantity of noxious matter, which if taken at one meal would be fatal; it is these small quantities of noxious matter, which are introduced into our food, either by accident or wilful adulteration, which we find so often upset the stomach, and not unfrequently lay the foundation of illness, and perhaps final ruination to health. To preserve the constitution, it should be our constant care, if possible, to counteract the effect of these small quantities of unwholesome matter; and whenever, in that way, an enemy to the constitution finds its way into the stomach, a friend should immediately be sent after it, which would prevent its mischievous effects, and expel it altogether; no better friend can be found—no, none which will perform the task with greater certainty, than NORTON'S CAMOMILE PILLS. And let it be observed that the longer this medicine is taken the less it will be wanted, and it can in no case become habitual, as its entire action is to give energy and force to the stomach, which is the spring of life, the source from which the whole frame draws its succour and support. After an excess of eating or drinking, and upon every occasion of the general health being at all disturbed, these Pills should be immediately taken, as they will stop and eradicate disease at its commencement. Indeed, it is most confidently asserted, that by the timely use of this medicine only, and a common degree of caution, any person may enjoy all the comfort within his reach, may pass through life without an illness, and with the certainty of attaining a healthy OLD AGE.

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Fire Premiums for the Year	£742,553 0 0
Losses	£355,161 12 8

LIFE DEPARTMENT.

Income from Premiums, after deducting Re-Assurances	£240,963 14 0

BONUSES DECLARED for the last two Quinquenniums:—£1 10*s.* per cent. per annum on sum Assured, upon all Policies entitled to participate.

FUNDS.

After providing for payment of the Dividend and Bonus, the Funds of the Company will stand as follows:—

Capital paid-up	£289,545 0 0
Fire Fund	400,000 0 0
Reserve Fund	500,000 0 0
Balance of Profit and Loss	92,745 19 0
Life Funds	1,976,146 11 9
	£3,258,437 10 9

GROWTH OF FUNDS.

1872	£2,361,812
1873	2,645,503
1874	2,957,174
1875	3,258,437

Extract from Auditors' Report.

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Assurance Fund (accumulated solely from Premiums) ..	£675,883 3 8
Net Liability under Assurance and Annuity transactions..	337,366 16 0
Surplus available for future Bonus and Expenses	£338,516 7 8

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Persons Assuring in Great Britain have the option of *Participating* Rates of Premium, or of *Non-Participating* Rates.

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Reduced Premiums.—Assurances may be effected upon payment of four-fifths of the rates chargeable according to the Society's Table, subject to *certain conditions* fully set forth and explained in the Prospectus.

Claims.—The total amount of Claims paid upon death from the commencement of the Society to 1st June, 1876, was **£1,365,023.**

Bonus.—The whole available Bonus is the sole property of Life Assurers; no part whatever is taken from it to be shared amongst Proprietors. At the end of every fifth year, profits are equitably apportioned amongst existing Life Assurances. By means of Bonus, many of the earlier Life Assurances have been relieved altogether from the payment of Annual Premiums, and additions in almost every case have been made to the sums Assured; £343,140 was divided amongst Life Assurances at the declaration of Bonus on 1st June last.

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ASSURANCES may be effected on LIVES, SURVIVORSHIPS, &c., &c., as stated in the Society's Prospectus, to any amount not exceeding £7,500.

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Prospectuses, Bonus Accounts, Forms of Proposal, &c., may be had at the Office, on personal application, or by letter.

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FOR LIVES ONLY,

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	£
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LIFE ASSURANCE SOCIETY,

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The **lowest** rates of Premium on the **Mutual System**, for young and middle-aged lives, with early participation in Profits.

Security.—Accumulated Fund	**£3,148,533**
Annual Income	**354,969**
Claims paid, with Bonus Additions	**5,040,186**
Bonuses declared	**2,858,415**

Bonus.—The Society being on the **mutual** principle, the Assured share the **whole of the Profits.** Policies effected before 31st December of each year, receive a full year's Bonus for the year of entry on their first participation.

Table of Annual Premiums required for an Assurance of £100 *for the whole Term of Life, with Participation in Profits.*

	£	s.	d.		£	s.	d.
20	1	14	7	35	2	10	11
25	1	19	0	40	2	19	9
30	2	4	3	45	3	11	9

Assurances granted to the extent of **£10,000** on a single life.

Prospectuses, Statement of Accounts, and full particulars may be obtained on application to

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OPPOSITE THE MANSION HOUSE, LONDON.

Founded A.D. 1762.

THE OLDEST LIFE OFFICE ON THE MUTUAL PRINCIPLE IN THE WORLD.

BONUS TABLE FOR 1877.

TABLE showing the Amount payable under a Policy for **£1,000** (with its additions), in the event of its becoming a claim after payment of the premium due in the year **1877.**

Policy No.	Policies effected since December 31, 1816.	Sum payable with Additions.	
		£	s.
1 to 164	From 1st Jan. 1817 to 24th April 1817	2855	0
165 to 660	„ 24th April 1817 to 16th April 1818	2775	0
661 to 1019	„ 18th April 1818 to 4th Feb. 1819	2695	0
1021 to 1413	„ 5th Feb. 1819 to 3rd Jan. 1820	2615	0
1415 to 1856	„ 7th Jan. 1820 to 22nd Dec. 1820	2535	0
1857 to 2245	„ 23rd Dec. 1820 to 30th Nov. 1821	2455	0
2247 to 2699	„ 1st Dec. 1821 to 7th Mar. 1823	2375	0
2700 to 3082	„ 7th Mar. 1823 to 24th May 1824	2295	0
3083 to 3349	„ 25th May 1824 to 8th Mar. 1825	2215	0
3350 to 3792	„ 9th Mar. 1825 to 3rd Nov. 1826	2160	0
3794 to 4207	„ 7th Nov. 1826 to 15th July 1828	2105	0
4210 to 4617	„ 21st July 1828 to 1st Mar. 1830	2050	0
4618 to 4973	„ 3rd Mar. 1830 to 24th Nov. 1831	1995	0
4974 to 5328	„ 24th Nov. 1831 to 1st Aug. 1833	1940	0
5329 to 5678	„ 1st Aug. 1833 to 18th June 1835	1885	0
5679 to 6024	„ 19th June 1835 to 21st July 1837	1830	0
6025 to 6360	„ 21st July 1837 to 22nd Jan. 1839	1775	0
6363 to 6727	„ 24th Jan. 1839 to 10th Dec. 1840	1720	0
6730 to 7044	„ 15th Dec. 1840 to 2nd Nov. 1842	1665	0
7045 to 7446	„ 12th Nov. 1842 to 18th June 1845	1630	0
7448 to 7740	„ 19th June 1845 to 2nd Mar. 1847	1595	0
7741 to 7997	„ 3rd Mar. 1847 to 14th Nov. 1848	1560	0
7998 to 8272	„ 14th Nov. 1848 to 19th Nov. 1850	1525	0
8273 to 8586	„ 19th Nov. 1850 to 26th July 1853	1490	0
8587 to 8835	„ 26th July 1853 to 31st Dec. 1855	1455	0
8836 to 8974	„ 1st Jan. 1856 to 31st Dec. 1856	1420	0
8975 to 9102	„ 1st Jan. 1857 to 31st Dec. 1857	1385	0
9103 to 9221	„ 1st Jan. 1858 to 31st Dec. 1858	1350	0
9222 to 9359	„ 1st Jan. 1859 to 31st Dec. 1859	1315	0
9360 to 9463	„ 1st Jan. 1860 to 31st Dec. 1860	1297	10
9464 to 9586	„ 1st Jan. 1861 to 31st Dec. 1861	1280	0
9587 to 9720	„ 1st Jan. 1862 to 31st Dec. 1862	1262	10
9721 to 9819	„ 1st Jan. 1863 to 31st Dec. 1863	1245	0
9820 to 9953	„ 1st Jan. 1864 to 31st Dec. 1864	1227	10
9954 to 10,065	„ 1st Jan. 1865 to 31st Dec. 1865	1192	10
10,066 to 10,154	„ 1st Jan. 1866 to 31st Dec. 1866	1157	10
10,155 to 10,250	„ 1st Jan. 1867 to 31st Dec. 1867	1122	10
10,251 to 10,320	„ 1st Jan. 1868 to 31st Dec. 1868	1087	10
10,321 to 10,454	„ 1st Jan. 1869 to 31st Dec. 1869	1052	10
10,455 to 10,699	„ 1st Jan. 1870 to 31st Dec. 1870	1035	0
10,700 to 10,891	„ 1st Jan. 1871 to 31st Dec. 1871	1017	10

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Nine-tenths of the Profits are divided among the Assured every Five Years.

At an Extraordinary General Meeting held on June 9, 1875, the sum of £844,379 was set aside as the value of the Society's liabilities under its Assurance and Annuity Contracts, and £173,180 was ordered to be divided as Bonus; leaving a balance of undivided profit of £20,033.

The Society's Liabilities were valued according to the Tables of the Institute o Actuaries.

TABLE of the TOTAL ADDITIONS made up to DECEMBER 31, 1874, to POLICIES of £1,000 each.

Age at Entry.	Number of Premiums Paid.					
	Thirty.	Twenty-five.	Twenty.	Fifteen.	Ten.	Five.
30	£685 10 0	£549 0 0	£434 10 0	£290 10 0	£175 0 0	£78 10 0
45	841 0 0	678 10 0	533 0 0	353 10 0	211 0 0	93 0 0
60	———	———	787 10 0	517 0 0	310 10 0	137 10 0

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Fire and Life Assurance Company,

11, LOMBARD STREET, LONDON, E.C.

West-end Office.—4, WHITEHALL, S.W.

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Participating Policy-holders receive every five years four-fifths of the profits realised.

Trust Policies for Wife and Children issued under the "Married Women's Property Act."

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The Directors invite attention to the exceptionally good security which this Company offers.

The published Accounts and the Prospectus give the fullest information respecting the state of the Company's affairs, and the terms on which Fire and Life Assurances may be effected.

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Septennial Policies as heretofore.

In the Life Department, 55 to 65 per cent. of the Premium of Members' Policies.

No Policy Holder is subject to **any Personal Liability.**

The Directors are **willing to appoint as Agents persons of good position and character.**

31st DECEMBER, 1875.

Claims paid on Life Policies to this date	£1,260,127.
Amount of Profits returned ditto	916,915.
ASSETS.	
Accumulated Fund	£1,627,146.
Present Value of Life Premiums	1,475,484.
LIABILITIES.	
Present Value of Sums Insured (£3,841,886)	£1,893,659.
Present Value of Life Annuities (£7,262 per Ann. and £310 Contingent)	52,879.
Annual Income	225,290.

The Accounts of the Society may be had on application at the Office.

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T. Brocklebank, Esq.	H. Littledale, Esq.	William Paton, Esq.
C. J. Corbally, Esq.	G. H. Loxdale, Esq.	J. Rome, Esq.
Alfred Fletcher, Esq.	Geo. Melly, Esq.	J. A. Tobin, Esq.
Arthur P. Fletcher, Esq.		

Secretary of the Company—J. M. Dove, Esq.

Assistant Secretary—A. Duncan, Esq.

Auditors—Peter S. Boult, Esq., and Isaac Kitchen, Esq.

Medical Referees—J. R. W. Vose, Esq., M.D., and E. R. Bickersteth, Esq.

Bankers—Bank of Liverpool; Union Bank of London.

Solicitors—Messrs. Laces, Bird, Newton, and Richardson.

LONDON BOARD.—1, CORNHILL, AND CHARING CROSS.

Chairman—Sir Chas. Nicholson, Bart., D.C.L.

Deputy-Chairman—W. Nicol, Esq.

W. Dent, Esq.	W. Macnaughtan, Esq.
Hon. E. Drummond.	Ross D. Mangles, Esq.
R. W. Gaussen, Esq.	James Morley, Esq.
Hon. S. Carr Glyn.	G. D. Whatman, Esq.

Actuary of the Company and Resident Secretary—Aug. Hendriks, Esq.

Fire Superintendent—T. Septimus Marks, Esq.

Auditor—H H. Cannan, Esq.

Medical Referees—J. R. Bennett, Esq., M.D., A. Anderson, Esq., F.R.C.S.

Consulting Surgeon—Sir James Paget, Bart.

Bankers—The London and County Bank; Messrs. Glyn, Mills, Currie, and Co.

Solicitors—Messrs. Palmer, Bull, and Fry.

Surveyors—E. N. Clifton, Esq., and Wm. Thompson, Esq.

At the **ANNUAL MEETING**, held February 23, 1876, the Report of the Directors for the Year 1875 showed that:—

The Fire Premiums were.....£1,040,568 | The Life Premiums were..... £255,259

The Invested Funds ..... £5,168,210.

THE

LONDON ASSURANCE CORPORATION,

Incorporated by Royal Charter, A.D. 1720.

No. 7, ROYAL EXCHANGE, LONDON, E.C.

EDWARD BUDD, Esq., *Governor.*
MARK WILKS COLLET, Esq., *Sub-Governor.*
WILLIAM RENNIE, Esq., *Deputy-Governor.*

DIRECTORS.

Hugh G. Arbuthnot, Esq.
Robert Burn Blyth, Esq.
William T. Brand, Esq.
Major-General H. P. Burn.
George W. Campbell, Esq.
G. B. Dewhurst, Esq.
Robert B. Dobree, Esq.
George L. M. Gibbs, Esq.
Robert Gillespie, Esq.
Howard Gilliat, Esq.
Henry Goschen, Esq.
Edwin Gower, Esq.
A. C. Guthrie, Esq.
Louis Huth, Esq.
Henry J. B. Kendall, Esq.
Charles Lyall, Esq.
Capt. R. W. Pelly, R.N.
David Powell, Esq.
P. F. Robertson, Esq.
Robert Ryrie, Esq.
David P. Sellar, Esq.
Col. Leopold Seymour.
Lewis A. Wallace, Esq.
William B. Watson, Esq.

Secretary.
JOHN P. LAURENCE, Esq.

Actuary.
ARTHUR H. BAILEY, Esq.

Underwriter.
JOHN ANTHONY RUCKER, Esq.

Manager of the Fire Department.
THOMAS B. BATEMAN, Esq.

Physician.
EDWARD CLAPTON, M.D., St. Thomas's Street, Southwark.

Solicitors.
Messrs. JOHNSON, UPTON, & BUDD, 20, Austin Friars.
Messrs. COLLYER-BRISTOW, WITHERS, & RUSSELL, 4, Bedford Row.

West End Agents.
Messrs. GRINDLAY & CO., 55, Parliament Street, S.W.

This Corporation has granted Fire, Life, and Marine Assurances for more than a Century and a half.

The Share Capital is £896,550, of which one-half, or 448,275, has been paid up. The total Funds, on the 31st December, 1875, exceeded £2,998,000.

LIFE DEPARTMENT.

Life Assurances may be effected either with or without Participation in Profits.

Copies of the Actuary's Report on the quinquennial valuation to 31st December, 1875, also of the accounts pursuant to "The Life Assurance Companies' Act, 1870," may be obtained on application.

FIRE DEPARTMENT.

Fire Insurances can be effected with the Corporation at moderate rates of Premium.

MARINE DEPARTMENT.

Policies of Marine Insurance are issued at the Head Office, and at Calcutta, Madras, Bombay, Mauritius, Hong Kong, and Shanghai.

JOHN P. LAURENCE, *Secretary.*

NORTH BRITISH AND MERCANTILE INSURANCE COMPANY.

ESTABLISHED IN 1809.

Incorporated by Royal Charter and Special Acts of Parliament.

CAPITAL TWO MILLIONS.

Accumulated Life Funds	**£2,771,492**
Fire Reserve Fund and Premium Reserve	**980,744**

DIRECTORS.

Chairman, John White Cater, Esq.
Deputy-Chairman, Charles Morrison, Esq.
Richard Baring, Esq., Merchant.
Richard Brandt, Esq., Merchant.
A. H. Campbell, Esq.
Edward Cohen, Esq., Merchant.
John Fleming, Esq., C.S.I.
P. du Pré Grenfell, Esq.
Right Hon. Lord Lawrence, G.C.B., G.C.S.I.
Hon. Hugh M'Culloch.
Junius S. Morgan, Esq., Merchant.
George Garden Nicol, Esq., Banker.
Baron John H. W. Schröder.
George Young, Esq., Merchant.

MANAGER OF FIRE DEPARTMENT.
G. H. Burnett.

SECRETARY.—F. W. Lance.

MEDICAL OFFICERS.
A. H. Hassall, M.D.: R. C. Cream, M.D.; Hermann Weber, M.D.

SOLICITOR.
Sir W. R. Drake.

GENERAL MANAGER.
David Smith, F.R.S.E.

LIFE DEPARTMENT.

THE PRINCIPLES on which this Company was founded, and on which it continues to act, combine the system of Mutual Assurance with the safety of a large Protecting Capital and Accumulated Funds, and thus afford all the facilities and advantages which can prudently be offered by any Life Assurance Office. Under these principles the business of the Company continues rapidly to increase.

NINETY PER CENT. of the WHOLE PROFITS is divided among the Assurers on the Participating Scale.

THE PROFITS are divided every Five Years.

POLICIES INDISPUTABLE after Five Years.

ANNUITIES of all kinds are granted, and the rates fixed on the most favourable terms.

FIRE DEPARTMENT.

PROPERTY OF EVERY DESCRIPTION, at Home and Abroad, Insured at the most Moderate Rates.

The net premiums for 1874 amounted to £824,941.

Prospectuses and every information can be obtained at the

CHIEF OFFICES—

LONDON: 61, Threadneedle Street, E.C.; WEST-END OFFICE: 8, Waterloo Place, S.W.; EDINBURGH: 64 Princes Street.

THE

PROVIDENT LIFE OFFICE,

50, REGENT STREET, LONDON, W.

FOUNDED 1806.

Branch Offices:—

CITY	.. 14, Cornhill, E.C.
EDINBURGH ..	.. 75, George Street.
DUBLIN	.. 113, Grafton Street.
LIVERPOOL ..	.. 3, Whitechapel, Lord Street.
MANCHESTER ..	.. 68, Fountain Street.
BIRMINGHAM ..	.. 20, Colmore Row.
LEEDS	.. 9, East Parade.
BRISTOL	.. 38, College Green.
EXETER	.. Queen Street.
CANTERBURY ..	.. St. George's Road.

Existing Assurances ...	**£5,526,706.**
Invested Funds	**1,878,819.**
Annual Income	**244,230.**
Claims Paid	**5,602,592.**

POLICIES effected before the 1st January, 1878, will be entitled to share in the next Division of Profits, in May, 1878.

In the PROVIDENT, a Bonus, immediately it is declared, becomes absolute property, and may at any time be surrendered for a Cash Payment,—applied to the Reduction of the Annual Premium,—or allowed to remain in addition to the Sum Assured.

BONUSES to the amount of £2,042,155 have already been declared.

QUEEN INSURANCE COMPANY.

CAPITAL—TWO MILLIONS STERLING.

CHIEF OFFICES:

QUEEN INSURANCE BUILDINGS, LIVERPOOL;

AND

60, GRACECHURCH STREET, LONDON.

FIRE.—LIFE.—ANNUITIES.

BOARD OF DIRECTORS.

Chairman.

BERNARD HALL, Esq. (Bernard Hall & Co.), Liverpool.

Deputy Chairmen.

JOHN BINGHAM, Esq., Merchant (J. Bingham & Co.), Liverpool.

THOMAS HOLDER, Esq., Cotton Broker (Chambres, Holder & Co.), Liverpool.

T. RIDGWAY BRIDSON, Esq. (T. R. Bridson & Sons), Bolton.

HENRY DUCKWORTH, Esq., Cotton Broker (Cowie, Duckworth & Co.), Liverpool.

ALBERT FENTON, Esq., J.P. (Mellor & Fenton), Cotton Brokers, Liverpool.

ANDREW GALBRAITH, Esq., Merchant, Glasgow.

EUSTACE GREG, Esq. (Greg & Co.), London.

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C. C. JOHNSTON, Esq., Merchant (S. Johnston & Co.), Liverpool.

GEORGE B. KERFERD, Esq., Merchant (G. B. Kerferd & Co.), Liverpool.

PETER M'LAGAN, Esq., M.P., of Pumpherston, Edinburgh.

JAMES MORTON, Esq., Greenock Iron Company, Greenock.

J. T. PAGAN, Esq., J.P., Guildford, and Reform Club, London.

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JOHN SHARP, Esq., Flax Spinner, Dundee.

EMIL SPRINGMANN, Esq., Merchant (Springmann & Co.), Liverpool.

N. W. J. STRODE, Esq., Chislehurst, and Carlton Club, London.

J. B. THOMSON, Esq., Broker (J. B. Thomson & Co.), Liverpool.

The following Extract from the "Eighteenth Annual Report" (year ending 31st December, 1875) will show the ample character of the Security offered.

THE FUNDS OF THE COMPANY STAND AS FOLLOWS:—

CAPITAL PAID UP	£180,035
LIFE ASSURANCE ACCUMULATION FUND	226,910
ANNUITY FUND	7,520
RESERVE FUND AND SUSPENSE ACCOUNT	220,000

LIFE BRANCH.

Extract from the Report on the Company's Life Branch, dated 6th May, 1874, by SAMUEL BROWN, Esq., late President of the Institute of Actuaries:—

"The *precautions* which have been taken *not to anticipate* any of the future Profits of the Company, and by using the Tables on which the Premiums are based, at a *very low rate of Interest*, to strengthen its position at all *future divisions*, are sure to lead to the *confidence and support* of the Public."

The Amount at the Credit of the Life Fund exceeds 63 per cent. of the entire Nett Premiums received on every Policy now in existence.

Careful Selection of Lives and consequent Large Bonuses.

The Company has paid, in satisfaction of Claims, £1,804,411.

J. MONCRIEFF WILSON, *General Manager.*
T. WALTON THOMSON, *Sub-Manager.*
J. K. RUMFORD, *Secretary in London.*

THE

GENERAL REVERSIONARY & INVESTMENT COMPANY.

Office—No. 5, WHITEHALL, LONDON, S.W.

ESTABLISHED 1836.

Further Empowered by Special Act of Parliament, 14 and 15 Vict., cap. 130.

CAPITAL, £500,000.

DIRECTORS.

Chairman—SEYMOUR TEULON, ESQ.
Deputy Chairman—JOHN CHAVE LUXMOORE, ESQ.

MAYOW WYNELL ADAMS, Esq.
THOMAS ALLEN, Esq.
WILLIAM ROBERT BARKER, Esq.
Colonel JOSEPH W. JASPER OUSELEY.
EDWARD CARLETON TUFNELL, Esq.
EDWARD WALMISLEY, Esq.

Auditors—Sir C. R. MCGRIGOR, Bart., M. J. R. BECHER, Esq., JOHN COOKES, Esq.
Bankers—Messrs. DRUMMOND.
Solicitors—Messrs. SHOUBRIDGE & MAY, 19, Lincoln's Inn Fields, W.C.

The business of this Company consists in the PURCHASE of, or LOANS upon—
REVERSIONARY INTERESTS, vested or contingent, in *Landed* or *Funded Property*, or *Securities;* also
LIFE INTERESTS in *Possession*, as well as in *Expectation;* and
POLICIES of ASSURANCE upon LIVES.

Loans upon Reversions may be obtained either at an Annual Interest, or in consideration of deferred charges, payable upon the *Reversions* falling in.

IMMEDIATE ANNUITIES are likewise granted upon the latter principle to persons entitled to Reversionary Interests, who may thus obtain an income until their property falls into possession, without being called upon for any payment until that event.

Prospectuses and Forms of Proposal may be obtained from the Secretary, to whom all communications should be addressed.

By order of the Board of Directors,
WM. BARWICK HODGE, *Actuary and Secretary.*

GOVERNESSES' BENEVOLENT INSTITUTION.

INCORPORATED BY ROYAL CHARTER,

WITH POWER TO HOLD LAND BY GIFT OR PURCHASE.

BOARD OF MANAGEMENT.

PATRICK BLACK, Esq., M.D.
THE REV. ALFRED J. BUSS, B.A.
J. BOND CABBELL, Esq.
ARTHUR RISDON CAPEL, Esq.
F. PATEY CHAPPELL, Esq.
GEORGE COCKLE, Esq.
THE LORD DUNSANY.
W. TIMBRELL ELLIOTT, Esq.
FREDERIC WILLIAM HAIGH, Esq.
JOHN WILLIAM HALE, Esq.
EDWARD B. HARTOPP, Esq.
THE LORD HOUGHTON.
THE HON. ARTHUR KINNAIRD, M.P.
THE REV. CHARLES MACKENZIE, M.A.
SIR ROBERT MONTGOMERY, K.C.B.
JOHN JEFFRYES OAKLEY, Esq.
EDWARD HENRY SCOTT, Esq.
THE EARL OF SHREWSBURY & TALBOT.
EDWARD THORNTON, Esq.
T. PARRY WOODCOCK, Esq.

Honorary Secretary—MRS. DAVID LAING.
Secretary—CHARLES WILLIAM KLUGH, Esq., 32, Sackville Street, W.
Secretary to the Provident Fund—JOHN EVEREST, Esq.

The objects of this Society are—

Temporary Assistance to Governesses in distress, afforded privately and delicately, through the Ladies' Committee.

Annuity Fund. Elective Annuities to Aged Governesses, secured on invested capital, and thus independent of the prosperity of the Institution.

Provident Fund. Provident Annuities purchased by Ladies in any way connected with Education, upon Government Security, agreeably to the Act of Parliament. This branch includes a Savings Bank.

A Home for Governesses during the intervals between their engagements.

A System of Registration, entirely free of expense.

An Asylum for the Aged.

Membership consists in the payment of an annual Guinea, or of Ten Guineas in one sum. Subscribers are entitled to vote for Annuities in the proportion of one Vote for each Annual Half-Guinea not in arrear, and for each Donation of Five Guineas. Subscriptions are due on the 1st of January, and can always be remitted by Post-Office Order, or by a Cheque crossed 'Sir S. Scott & Co.'

PRUDENTIAL ASSURANCE COMPANY,

62, LUDGATE HILL, LONDON, E.C.

REVERSIONS PURCHASED.

EVERY DESCRIPTION OF LIFE ASSURANCE AND ANNUITY BUSINESS TRANSACTED.

The Anunal Premium Income exceeds £1,000,000.

The Policies in this Company become absolutely indisputable after they have been in existence five years, or immediately, to the extent of the principal, interest, and costs, not exceeding the sum Assured if assigned to an innocent holder for a *bonâ fide* consideration.

The last Annual Report can be obtained upon application.

ROCK LIFE ASSURANCE COMPANY.

ESTABLISHED A.D. 1806.

No. 15, NEW BRIDGE ST., BLACKFRIARS, LONDON, E.C.

DIRECTORS.

G. P. BIDDER, Esq.
The Right Hon. J. G. DODSON, M.P.
G. A. FULLER, Esq.
J. GODDARD, Esq.
R. HUDSON, Esq., F.R.S.
Sir J. KELK, Bart.
S. LAURENCE, Esq.
Lieut.-Gen. Sir G. St. P. LAWRENCE, K.C.S.I., C.B.
T. H. LONGDEN, Esq.
C. T. LUCAS, Esq.
J. D. MAGENS, Esq.
C. RIVAZ, Esq.
C. RUGGE-PRICE, Esq.
W. B. TOWSE, Esq.
H. TRITTON, Esq.
S. H. TWINING, Esq.

The **ROCK LIFE ASSURANCE COMPANY,** which has been established nearly **Three Quarters of a Century,** has an **Accumulated Fund** of more than **Three Millions Sterling,** invested in Mortgages on Land, and other first-class Securities:—

	£	s.	d.
Viz., on the 20th August, 1875	3,167,289	2	9
Sum Assured—Inclusive of Bonus Additions—at that date	4,893,272	6	4
Estimated Liability thereon (Northampton Table of Mortality, 3 per Cent. Interest).	1,451,708	14	6
Being less than one-half the Fund invested.			
Total Amount of Bonus Additions made to Policies	3,251,871	3	9
Amount of Profits divided for the Seven Years ending 20th August, 1875	535,216	16	0
Annual Income	286,533	19	7
Total Claims paid—Inclusive of Bonus Additions	7,893,697	1	8

*** Copies of the Accounts deposited with the Board of Trade, pursuant to "The Life Assurance Companies' Act, 1870," as well as of the Periodical Valuation Accounts, and every information may be obtained on application.

H. W. PORTER, *Actuary.*

ROYAL EXCHANGE ASSURANCE CORPORATION.

(Established by Royal Charter, A.D. 1720.)

FOR SEA, FIRE, LIFE, AND ANNUITIES.

Chief Office, Royal Exchange, London; Branch, 29, Pall Mall.

THE ACCUMULATED FUNDS EXCEED £3,800,000.

JAMES STEWART HODGSON, Esq., *Governor*. CHAS. JOHN MANNING, Esq., *Sub-Governor*.
FRANCIS ALEXANDER HAMILTON, Esq., *Deputy-Governor*.

Directors.

ROBERT BARCLAY, Esq.
JOHN GARRATT CATTLEY, Esq.
MARK CURRIE CLOSE, Esq.
EDWARD JAMES DANIELL, Esq.
WILLIAM DAVIDSON, Esq.
ALEXANDER DRUCE, Esq.
FREDERICK JOSEPH EDLMANN, Esq.
CHARLES HERMANN GÖSCHEN, Esq.
CHARLES SEYMOUR GRENFELL, Esq.
ROBERT AMADEUS HEATH, Esq.
WILMOT HOLLAND, Esq.
EGERTON HUBBARD, Esq., M.P.
WILLIAM KNOWLES, Esq.
NEVILE LUBBOCK, Esq.
GEORGE FORBES MALCOLMSON, Esq.
DANIEL MEINERTZHAGEN, Esq.
WILLIAM ROBERT MOBERLY, Esq.
Lord JOSCELINE WM. PERCY.
Sir JOHN ROSE, Bart.
SAMUEL LEO SCHUSTER, Esq.
ERIC CARRINGTON SMITH, Esq.
OCTAVIUS WIGRAM, Esq.
MONTAGU CLEUGH WILKINSON, Esq.
CHARLES BARING YOUNG, Esq.

FIRE ASSURANCES on Liberal Terms.

LIFE ASSURANCES with or without participation in Profits.

LOANS are granted on security of LIFE INTERESTS in connexion with Policies of Assurance.

A large participation in Profits, with the guarantee of the invested Capital Stock, and exemption, under Royal Charter, from the Liabilities of Partnership.

All real improvements in modern practice, with the security of an Office whose resources have been tested by the experience of **more than a Century and a half.**

The Corporation are open to consider applications for Agencies.

A Prospectus, Table of Bonus, and Balance Sheet will be forwarded on application.

E. R. HANDCOCK, *Secretary*.

SOVEREIGN LIFE ASSURANCE COMPANY,

48, ST. JAMES'S STREET, LONDON, S.W.

CITY BRANCH—122, CANNON STREET, E.C.

Directors.

Chairman—Sir JAMES CARMICHAEL, Bart.

Deputy Chairman—JOHN ASHBURNER, Esq., M.D.

Lieutenant-Colonel BATHURST.
JOHN GARDINER, Esq.
CHARLES WILLIAM REYNOLDS, Esq.
Sir J. E. EARDLEY-WILMOT, Bart.
J. MORGAN HOWARD, Esq., Q.C.

The Directors endeavour, as far as the interests of the Office permit, to meet the requirements of the public in regard to Life Assurance to the utmost extent and on the most moderate terms.

Assurers in England can obtain advances in connection with their Policies.

The Funds of the Company are steadily increasing as evidenced by the Annual Accounts, copies of which can be had of

HENRY D. DAVENPORT,
Secretary.

MACMILLAN & CO.'S GLOBE LIBRARY.

Beautifully printed on toned paper, and bound in extra cloth, with gilt edges, price 4*s.* 6*d.* each; and in plain cloth, price 3*s.* 6*d.* each. Also kept in various morocco and calf bindings, at moderate prices.

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"We can almost sympathise with a middle-aged grumbler, who, after reading Mr. Palgrave's Memoir and introduction, should exclaim, 'Why was there not such an edition of Scott when I was a schoolboy.'"—*Guardian.*

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A Book of Reference indispensable to all Members of Parliament, Chambers of Commerce, Bankers, Insurance Managers, Stockbrokers, Merchants, Secretaries and Managers of Railways, and other Public Companies, Government Offices, Clubs Reading-Rooms, &c.

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The History of Lloyds, and of Marine Insurance in Great Britain, with an Appendix containing Statistics of, and a Dictionary of Terms used in, Marine Insurance. By FREDERICK MARTIN, author of the "Statesman's Year Book." 8vo., 14*s.*

"We have in the Editor of 'The Statesman's Year Book,' an industrious and conscientious guide, and we can certify that in his 'History of Lloyds' he has produced a work of more than passing interest. His appendix, containing figures towards a classification of wrecks, and diagrams illustrating the laws of storms and consequently of shipwreck, will be found invaluable to the technical reader."—*Times.*

A Short History of the English People. By J. R. GREEN. Crown 8vo. with Coloured Maps, Genealogical Tables, and Chronological Annals, 8*s.* 6*d.* Fortieth Thousand.

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FOR THE YEAR 1877,

PRINTED FOR THE

COMPANY OF STATIONERS.

MOORE'S ALMANAC.

This very popular Almanac, which besides the usual Calendar, contains a fuller account of the Eclipses and Astronomical phenomena of the Year than any publication of its class, was lately increased by several pages, giving lists of the Members of the Government, the Houses of Parliament, and other useful information, to which was last year added a half-sheet containing a List of the Principal Fairs in England. Price 6*d*.

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This Almanac contains a complete Calendar of the Festivals, &c., of the Church of England, with the Lessons appointed for every day in the year; a Diary of 90 pages for Memoranda; a complete List of the Dignified Clergy of each Diocese in England, Wales, Ireland, and the Colonies, with the official Armorial Bearings of Archbishop and Bishop; a List of the Incumbents of London and of parishes within ten miles of London; of the officials of the Universities and Public Schools; of the Head Masters of Endowed Grammar Schools; a very complete peerage, and other information interesting to the Clergy and Laity of England. Price 2*s*. 6*d*.

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